APRIL 1960

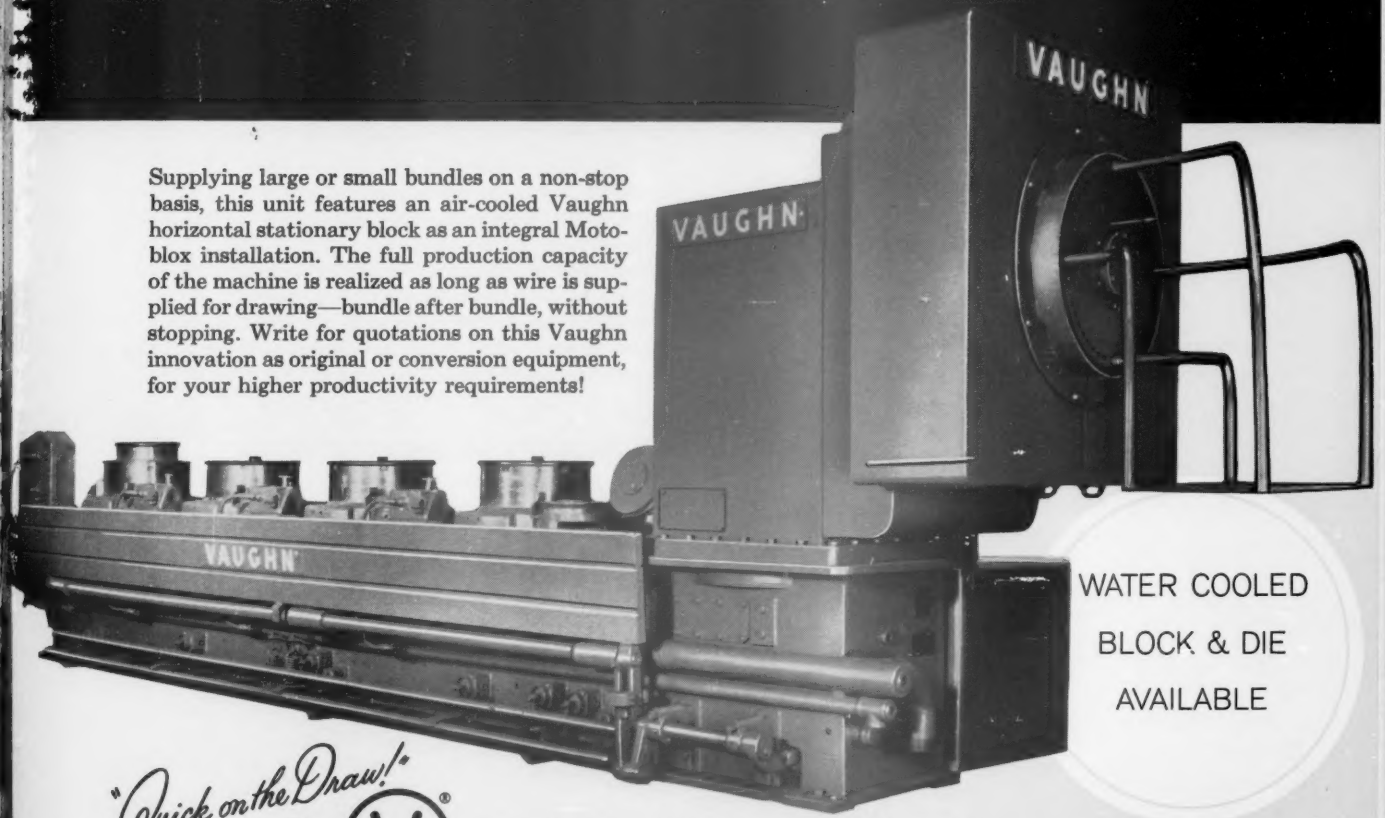
WIRE AND WIRE PRODUCTS

For Continuous High Production!

The Vaughn® Motoblox®

with INTEGRAL HORIZONTAL STATIONARY BLOCK

Supplying large or small bundles on a non-stop basis, this unit features an air-cooled Vaughn horizontal stationary block as an integral Motoblox installation. The full production capacity of the machine is realized as long as wire is supplied for drawing—bundle after bundle, without stopping. Write for quotations on this Vaughn innovation as original or conversion equipment, for your higher productivity requirements!



WATER COOLED BLOCK & DIE AVAILABLE

"Quick on the Draw!"

The Vaughn® Machinery Company

Cuyahoga Falls, Ohio, U.S.A.

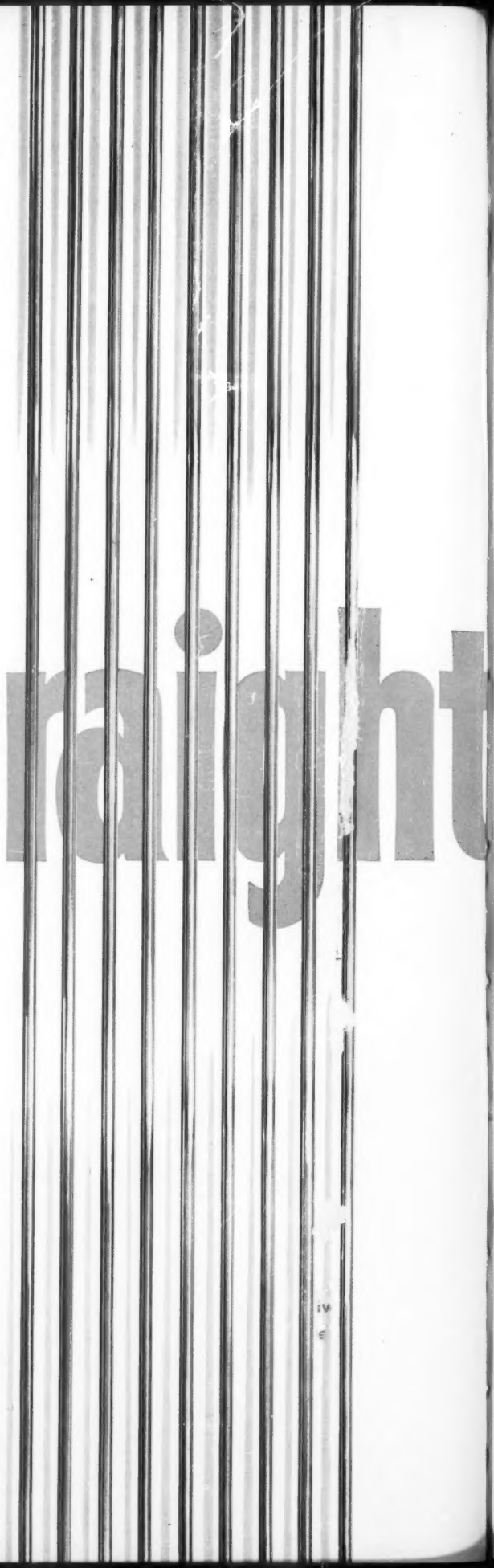
COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

When it comes to oil tempering of wire

.....Lee Wilson

gives it to you straight



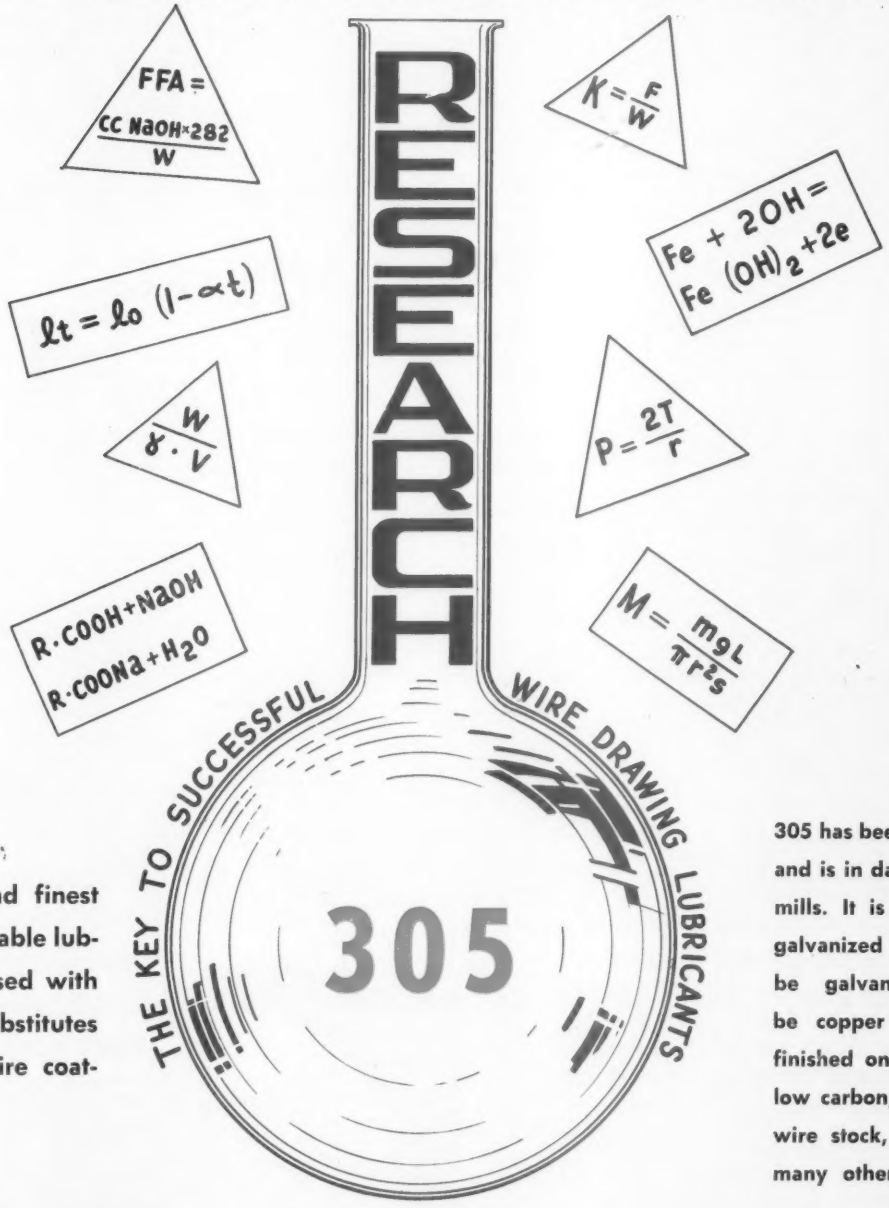
If your business includes steel oil tempered spring wire, you will be interested in Lee Wilson's continuous heat treating equipment for hardening and tempering this material. Especially accurate temperature control in the radiant tube fired settings, and with an oil quenching system to provide accurate and uniform quenching temperatures, the wire will develop physical properties to be within 175,000 and 200,000 P.S.I. with a camber tolerance of ½″ in 5′0″. The first unit of this design is in operation producing 2500# per hour of spring wire from .075″ to .500″ in diameter.

Lee Wilson* ENGINEERING COMPANY, INC.
20005 LAKE ROAD • CLEVELAND 16, OHIO

HIGH CONVECTION ANNEALING FURNACES
MAKE THE BEST METALS BETTER

*ORIGINATORS AND LEADING PRODUCERS OF HIGH CONVECTION ANNEALING FURNACES

"America's Finest Wire Draw"



The newest and finest of readily cleanable lubricants to be used with lime or lime substitutes for rod and wire coatings.

305 has been mill approved and is in daily use in major mills. It is being used on galvanized redraw, wire to be galvanized, wire to be copper coated, liquor finished on both high and low carbon, heatron spring wire stock, nail stock and many other wires.

"Look to Standard for the Future"

Cordially yours,

Standard Industrial has pioneered in most of the outstanding contributions to better wire drawing through better lubricants. Consult Standard Industrial for the solution of your difficult problems.

Standard Industrial
COMPOUNDS CO., INC.
Member WAS

FRANKFORT, ILLINOIS

(A suburban Chicago area city)
Telephones: 2131 - 2141

European Manufacturer:
Revalorizacion de Grasa y Acietes, S.A.
Gran Via No. 4, Bilboa, Spain.

Canadian Manufacturer:
H. L. Blatchford Ltd., 977 Aqueduct St., Montreal, Que.
H. L. Blatchford Ltd., 40 Titan Rd., Toronto, Ont.

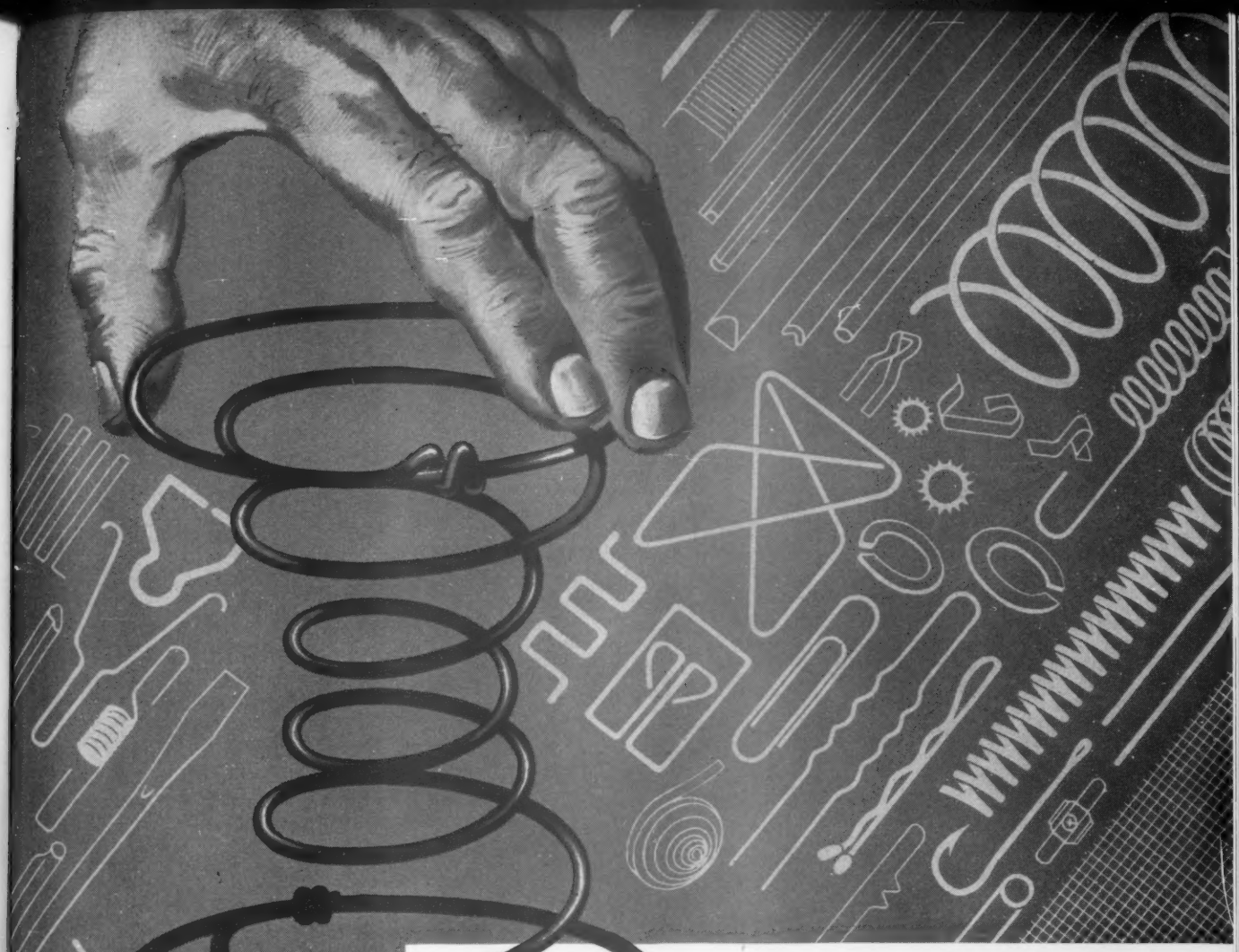
#8100 COMPOUND

7 REASONS WHY so many wire people are calling THE BLANE MAN for it

1. The Wire & Cable Industry has proven that Blane #8100 Compound gives dependability for 80°C & 90°C applications.
2. BLANE #8100 Compound is designed primarily for 80°C and 90°C Appliance wire, it has provided the dependability necessary to meet UL's accelerated aging requirements.
3. BLANE #8100 specifically passes the critical tests of 7 days at 113°C in 1/64" wall thickness and 7 days at 121°C in 1/32" wall thickness with a good margin of safety.
4. BLANE #8100 Compound is the only compound in its price range that has consistently met UL requirements of 7 days aging at elevated temperatures.
5. Blane's versatile #8100 Compound is UL bulletin approved for TW, including 60°C in oil, making it applicable for 90°C machine tool wire.
6. In addition to its high temperature features BLANE #8100 Compound has outstanding low temperature characteristics and is recommended for MILW 76A applications.
7. The BLANE MAN specializes in personal friendly service.

Why don't you plan to get acquainted with the BLANE MAN'S #8100 Compound? Samples and technical data on request.

THE BLANE CORPORATION
CANTON, MASSACHUSETTS



LET'S TALK WIRE!

This spring is typical of hundreds of types and sizes of springs made from PAGE wire—and springs are just one of the many end products for which PAGE manufacturers wire is a logical choice.

Regardless of your use of wire, you can count on PAGE uniformity. Whether you make hairpins or lock washers, PAGE wire will give you the tensile strength, ductility, finish, tolerance and other properties you require.

PAGE facilities are designed to produce a wide range of high quality manufacturers wire items—including special shapes. Where requirements are exacting, you will find PAGE wire unexcelled.

Since 1902, we have pioneered many "firsts" in the wire industry. The latest of these is corrosion-resistant ACCO Aluminized Wire—commercially pure aluminum bonded to a steel core.

Why not put PAGE experience and knowledge to work for you to improve your product and lower your costs.

Let's get together and talk wire!

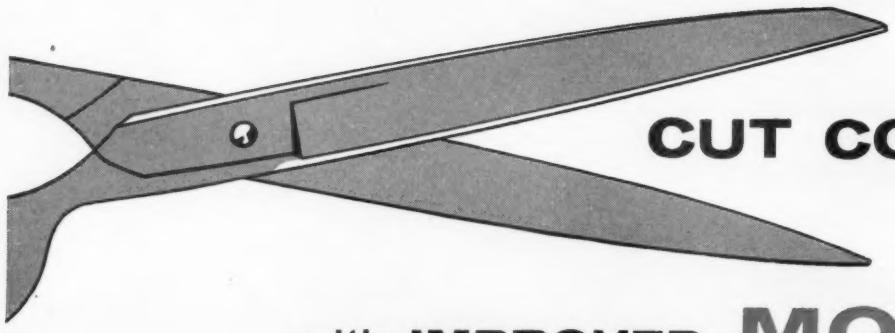
ACCO

PAGE MANUFACTURERS WIRE

Page Steel and Wire Division • American Chain & Cable Company, Inc.

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.

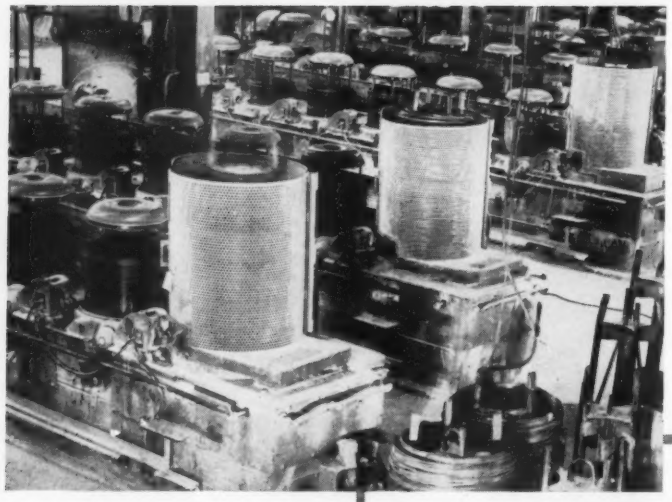
PAGE *-the source for answers to wire problems*



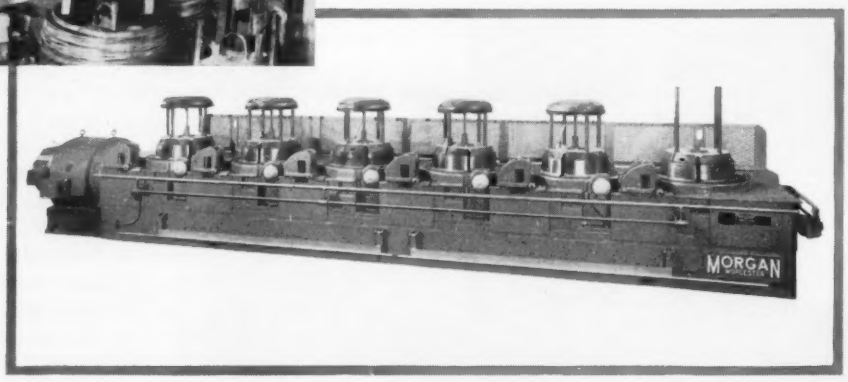
CUT COSTS

with **IMPROVED** MORGAN CONNOR

Wire Machines



You get the best in production-proved equipment with the latest refinements when you use Morgan-Connor Wire Machines. These machines enable you to produce large, heavy-weight bundles rapidly with low power costs and minimum space requirements.



MORGAN CONSTRUCTION CO.

WM-116

WORCESTER, MASSACHUSETTS, U. S. A.

ROLLING MILLS | MORGOIL BEARINGS • WIRE DRAWING MACHINES • COMBUSTION CONTROLS

WIRE AND WIRE PRODUCTS*

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

VOL. 35 APRIL, 1960 No. 4

Designated as Official Publication By The Wire Association

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TWO KINDS OF PEOPLE USE

CAREW CUTTERS

EXPERIENCED & INEXPERIENCED

THE INEXPERIENCED DON'T KNOW ANY BETTER. THE EXPERIENCED DON'T KNOW ANY BETTER EITHER.

FOR THERE IS NO BETTER

Whether or not you are experienced, you can benefit by our 96 years of experience.

—●—

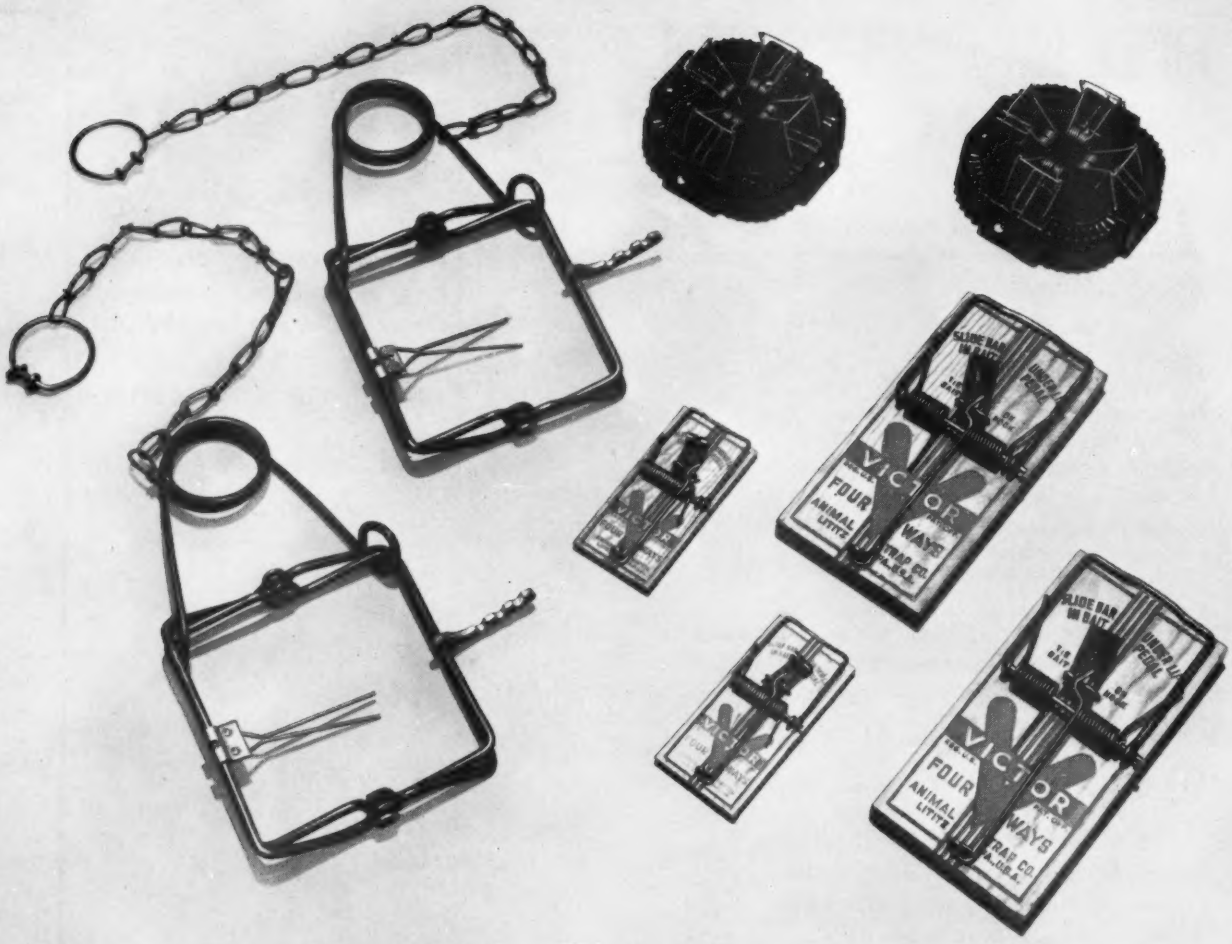
CAREW CUTTERS
are used in wire and spring plants throughout the world.

FOUR SIZES
CUT WIRE TO ¼" DIAM.
made by

M. W. ROBINSON CO., INC.
ROCKFALL, CONN., U.S.A.

stocked by most
Mill Supply Jobbers

96 Years of Cutting Wire and Costs



The products illustrated are made by The Animal Trap Co., Lititz, Pa., a regular user of Bethlehem wire.

Steel wire builds that better trap

Whether you want to trap animals or catch customers, you can count on Bethlehem for top-quality specialty steel wire. Wire for animal traps, flexible shafts, rotisserie spits, welding, screw drivers, or hose-reinforcement . . . these are just a few of hundreds of uses for Bethlehem specialty wire.

Bethlehem Steel can turn out the exact wire for your requirements. All our metallurgists need to know is what you will do with it, and what conditions it must meet. We will select the right steel wire and give it the processing necessary to do the job.

Whether you need coppered wire, liquor-finished wire, fine wire, shaped wire, cold-heading wire . . . or industrial quality wire, we'll be glad to talk it over. Quite often we can help you turn a problem into a profit.

Just get in touch with the Bethlehem sales office nearest you. Or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

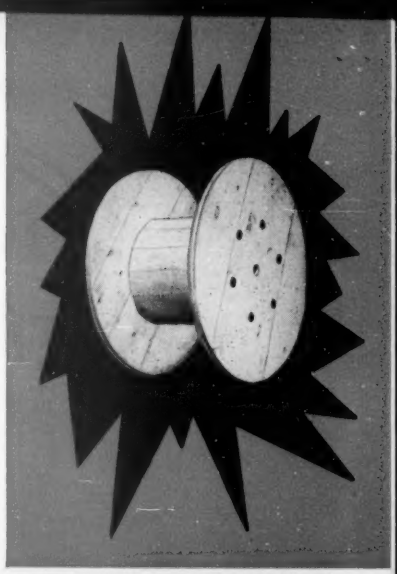
BETHLEHEM STEEL

Saw mill at Bradford, N. H., where logs are processed into lumber.

HOW BRIDGE SUPPLIES ONLY THE BEST REELS

Our company is progressive. Since we began the manufacture of wood reels our plant has undergone continued expansion and improvement in production facilities.

In recent years modern affiliated companies have been established in New Hampshire to further enable us to better serve the growing needs of the wire industry.



NON-RETURNABLE

WOOD REELS IN ALL SIZES FOR ALL TYPES OF ELECTRIC WIRE AND CABLE

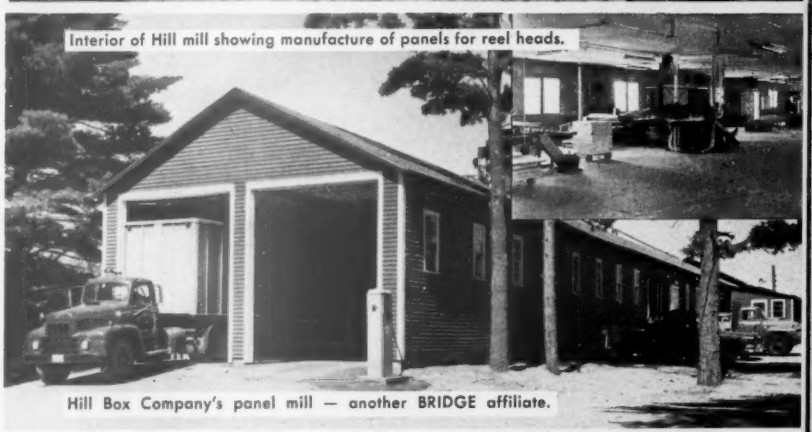
- Controlled saw mill work
- Air seasoning of lumber
- Conversion of stock into panels and square-edge lumber
- Maintenance of millions of board feet of lumber in inventory
- Efficient, modern material handling methods and equipment

Interior of the Kearsarge plant.

Plant of Kearsarge Reel Co. — an affiliate of Bridge Manufacturing Co.

Planing and cutting round-edge lumber prior to forming into reel head panels.

NON-RETURNABLE REELS GIVE YOU A DEFINITE PACKAGING COST



Interior of Hill mill showing manufacture of panels for reel heads.

Hill Box Company's panel mill — another BRIDGE affiliate.

"REEL" GOOD —

Let us quote on your Reel needs. Send in your specifications. Better yet, visit our plant and see how Reels are made so well at so low a cost.

WOOD REELS

HIGH-SPEED SHIPPING SERVICE IN OUR OWN TRUCKS WITHIN A RADIUS OF 250 MILES OF THE PLANT, FAST FREIGHT WILL BRING YOU BRIDGE REELS WITHIN A FEW DAYS TO POINTS EAST OF THE MISSISSIPPI.

TEL: THOMPSONVILLE, CONN.
Riverview 9-8308

CF&I WIRE HELPS PACKAGED for YOUR PRODUCTION

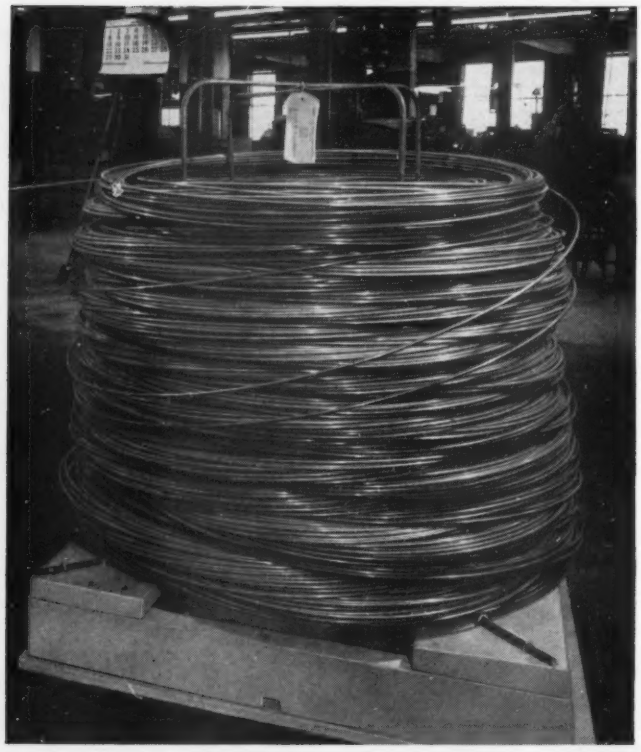
"CF&I Stem-paks cut machine loading time 80%... give us an extra hour of production every day," stated Mr. Frederick Voos, Plant Superintendent, Risdon Manufacturing Co., Waterbury, Conn.

PROBLEM

1. "Our specially designed machines *were* fed wire from coils averaging 150 lbs. Because of the small size, frequent machine loadings were necessary. Each time, the coils had to be loaded by hand and the bindings clipped, after which the wire was guided through the straighteners before entering the machine. We were losing valuable production time due to excessive machine downtime," explained Mr. Voos.

SOLUTION

1. "Our Purchasing Department called a CF&I salesman who carefully examined our operation and recommended that we switch to CF&I Stem-paks which hold up to 1,000 lbs. of one continuous length of wire. Each Stem-pak feeds a machine for an average of one to two days... a production time equal to using seven coils with set-ups in the past.



CF&I Stem-paks are delivered on pallets for fast unloading and easy in-plant handling by fork trucks.

"Stem-paks give us approximately an extra hour of production per day on each machine," Mr. Voos pointed out. "A Stem-pak can be set up in one-fifth of the time required for the seven coils of wire formerly used... *a saving of 80% on loading time.* The extra hour of production represents a 12½ % increase in the operator's production time."

PROBLEM

2. "Part of our operation required the use of wire that was free from rust, grease or dirt. Too often, unprotected coils would collect dirt in transit or storage.

SOLUTION

2. "CF&I Fibre Drums are an ideal answer to the problem of unclean wire. The sturdy Fibre Drum has a metal cover and locking band which seals the drum, protecting the wire from grime and from corrosive elements. In addition, Fibre Drums hold up to 600 lbs. of one continuous length of wire which enables us to run our machines for a longer time than when we used small coils."

Stem-paks and Fibre Drums are just two of nine wire packages that CF&I offers to help make your operation more efficient and economical. When you order from

INCREASE PRODUCTION 12½%

at Risdon Manufacturing Co., Waterbury, Conn.

Risdon Mfg. Co. also uses CF&I Fibre Drums, which hold up to 600 lbs. of wire, for special operations. The sealed Fibre Drums protect the wire against rust and contamination during transit and in-plant storage. Note how closely the Fibre Drums can be placed to the machine and how evenly the wire pays off.

A Stem-pak is easily placed in storage alongside Fibre Drums. No messy storage problems... no chance of coils becoming tangled. Inventory of this neat, compact storage set-up is a quick, simple counting job.

CF&I, you can specify wire *packaged for your production* to give you one or more of these benefits:

- **less downtime through extra-long continuous lengths of wire**
- **compact storage and simplified inventory control**
- **fast unloading and in-plant handling**
- **assured cleanliness of the wire**
- **smooth pay off of the wire**

A CF&I salesman will be glad to assist in selecting the *right* wire package for your operation. There's no charge for this service, so call our nearest sales office today.

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco San Leandro • Seattle • Spokane • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

CF&I OFFICE IN CANADA: Montreal • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg 7021

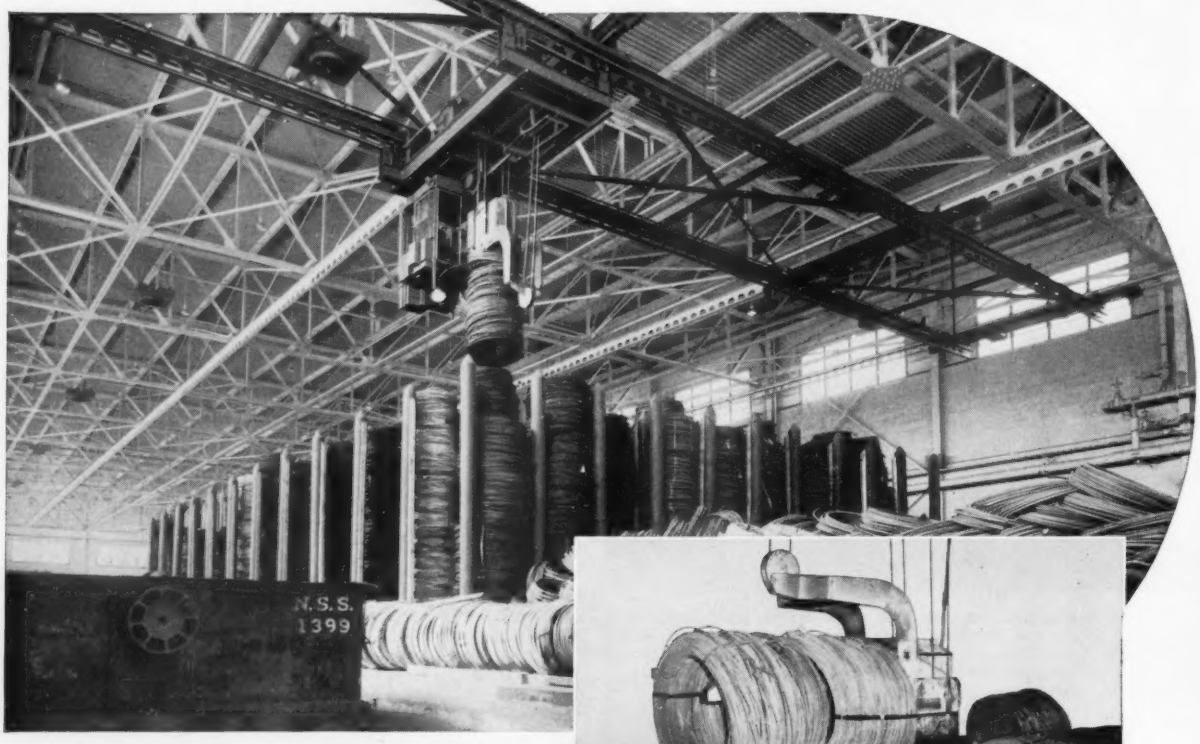
FOR REAL COIL SELECTIVITY

CONSIDER THIS SYSTEM

Any Coil In Hundreds of Varieties QUICKLY REACHED

2190 tons of rod can be stored vertically in this 5000 sq. ft. storage and any variety can be withdrawn immediately.

The 98'-0" span cab-operated Cleveland Tramrail crane has 5 tons capacity, is of double-girder construction and operates on four overhead tracks.



Picking up 3600 lbs. of rod from a railroad car with the hydraulically-operated Cleveland Tramrail grab.

SOME mighty outstanding advantages are provided in the rod storage at the modern plant of The Cleveland Cap Screw Co., Cleveland, by a Cleveland Tramrail vertical storage system which includes an overhead cab-operated crane and hydraulically-operated hairpin hook.

The system enables storing a great variety of sizes, heats and alloys in piles to heights of 17 feet and permits immediate access to any item without handling or disturbing others. Complete inventory can be maintained by the operator from his crane cab.

That is not all. The system has boosted efficiency tremendously by greatly reducing the man-hours of time required per ton. The crane operator alone takes care of the whole storage job. This includes picking coils from incoming railroad cars, placing into storage and removing from storage for delivery to production departments.

Get the facts on this most modern of all wire and rod storage methods.

"Ask for free copy of Booklet No. 2008"

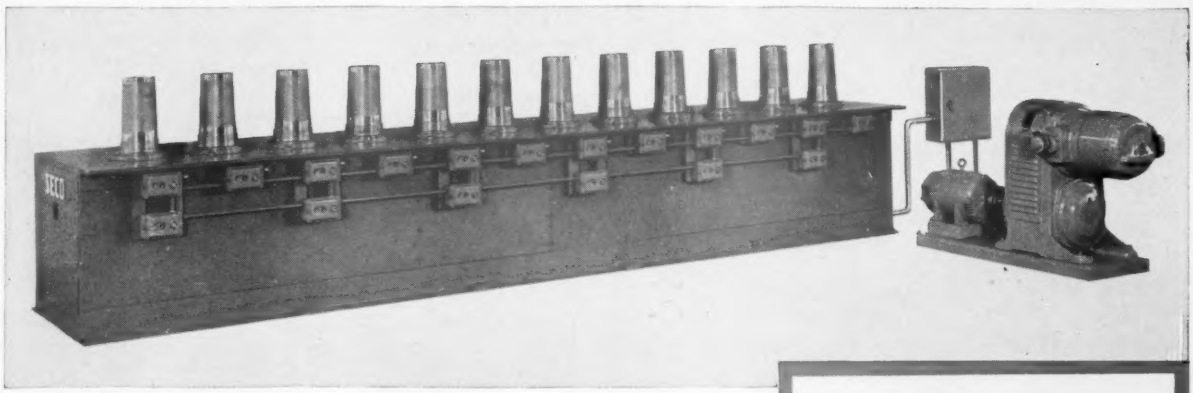
CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 9227 E. 288 ST. • WICKLIFFE, OHIO

SECO Fine wire TAKE-UP FRAMES

The "last-word" in wire-winding efficiency!



- **Simplified Design and Construction**
- **Synchronized Electrical Variable Speed**
- **Noiseless, Vibrationless Running**
- **Greatly Increased Operating Capacity**

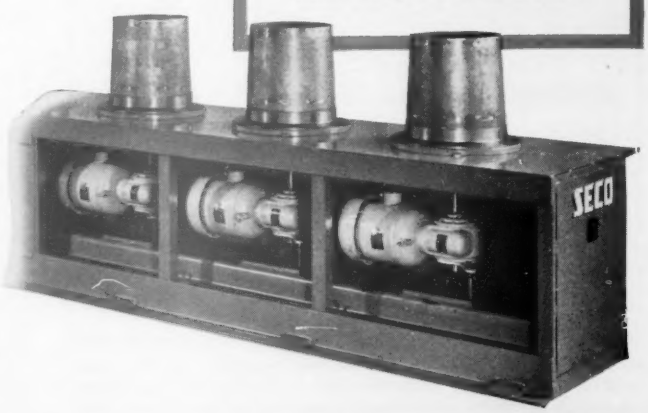
SECO builds take-up frames for handling fine gauge steel or non-ferrous wire on 8", 12", or 16" diameter blocks...with linear wire speeds up to 1,000 FPM or higher. Superior features include a multiple electrical drive system (alternating current) for synchronized electrical transmission of variable speed power.

This gives simultaneous speed changes to all spindle blocks, in ratios up to 5:1 or even 10:1 or higher. It provides push-button stop-start control to each of the gear motors driving each spindle block. Gone is the old bevel gearing, with manually operated clutches for starting and stopping the blocks.

SECO high production take-up frames are constructed to accommodate any number of spindles required. Frames with horizontal spindles can also be built. Call or write for complete information and data. Consultation invited—no obligation.

SHOWN ABOVE:
SECO Take-Up Frame and VARIDYNE Electrical Power Unit which provides synchronized variable speed to the multiple drives. AC current is employed throughout, and the VARIDYNE System "gears" all the drives together by electrical impulses.

SHOWN BELOW:
The AC squirrel-cage induction type gear motors which drive the spindle blocks through hollow bored shafts.



STEEL EQUIPMENT COMPANY
P. O. BOX 737, WARRENSVILLE STATION
CLEVELAND 22, OHIO

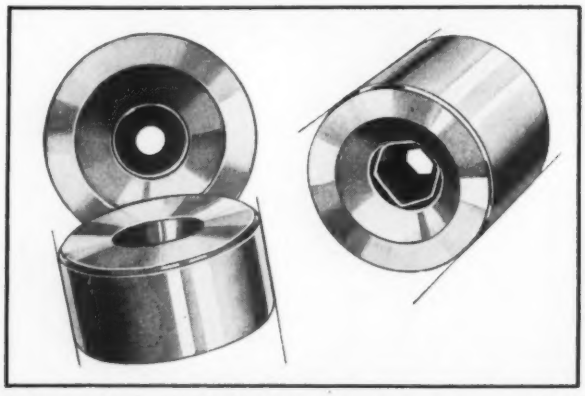
SECO

Metallurgical Memo from General Electric

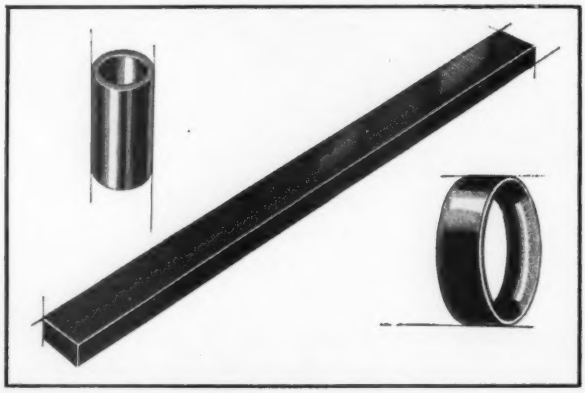
"MOVING METAL" WITH G-E CARBOLOY® CARBIDES

maintains uniformity in size... better finish... less cost per ton with more durable grain structure in the part

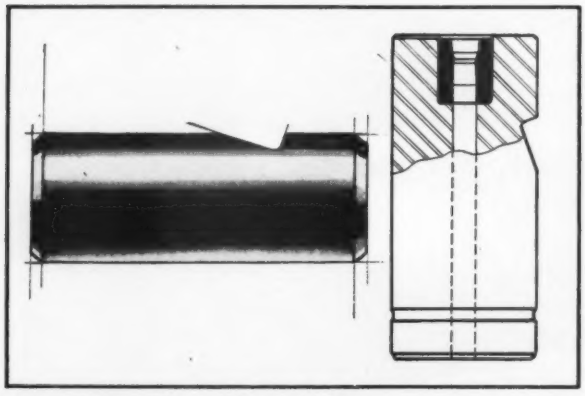
Continuing research by General Electric's experienced metallurgists and technicians gives you Carboloy cemented carbides of highest quality and uniformity—carbides designed to "move metal" at lower cost and with less metal waste. *Metallurgical Products Department of General Electric Company, 11171 E. 8 Mile Street, Detroit 32, Michigan.*



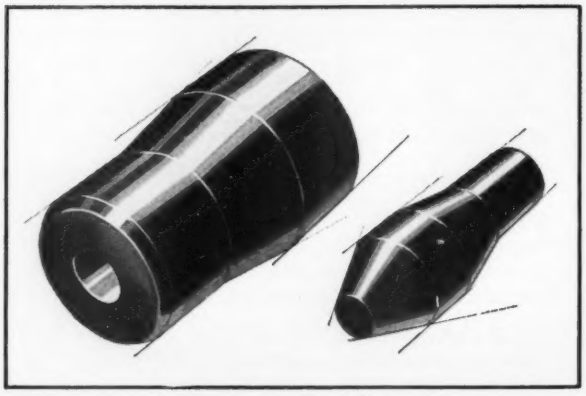
GET MORE WIRE TONNAGE with uniform size and finish. Carboloy carbide wire, bar and tube dies boost product output, permit longer runs with less die wear, minimize downtime. Available in round, square, hexagon shapes.



BOOST WIRE PRODUCTION SCHEDULES by wear-proofing critical parts with G-E carbide wire guide bushings, strips, and guide rings on wire stranding and processing machinery. Last up to 100 times longer in some cases than those made of other materials!



TOP QUALITY AND PERFORMANCE in boltmaking machinery depends on header extrusion dies equipped with Carboloy cemented carbides—which help to produce more uniform parts to closer tolerances; resist stress and strain of the heading and extruding operation.



TUBE DRAWING WITH CARBOLOY MANDRELS provides uniform wall thickness. Tailored to your order, G-E mandrels come in brazed and solid carbide styles. Brazed-type custom-made from standard and special Carboloy nibs. Available from your Authorized Die Distributor or Diemaker.

CARBOLOY® CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT

GENERAL ELECTRIC

CARBOLOY® CEMENTED CARBIDES • MAN-MADE DIAMONDS • MAGNETIC MATERIALS • THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS

WHITACRE 22″ WIRE DRAWING DEAD BLOCK

Continuous Production—Efficiency Approaching 100%

Gives you these advantages

Continuous increased production achieved by: • No down time for stripping • Permits packaging into stationary container or uninterrupted palletizing on stems • No tangling nor snarling from handling • Design simplicity. No back-gearing nor similar mechanisms • Greatly reduced floor space requirements • Dies in supplying drawing machine can be changed without stopping dead block • Accumulation type machines can be "run down" without stopping dead block • Continuous inspection and sampling • Breaks welded in production — low scrap loss • Increased production with lessened operator fatigue • Maintenance eliminated except for occasional lubrication of four main bearings and two motor bearings • Dead block can be located anywhere with wire literally piped from wire drawing machine • Extra large packages for in-process wire • Greatly reduced handling and in-plant transportation costs • Low capital investment.

OTHER MODELS AVAILABLE

16″ Wire Drawing Dead Block, Model DB-16A • 26″ Wire Drawing Dead Block, Model DB-26A • Combination 16″ and 22″ Galvanizing or Tinning Dead Block Take-ups, Model GB-2216A • 26″ Heavy Wire Galvanizing or Tinning Dead Block Take-up, Model GB-26B.

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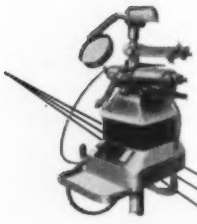
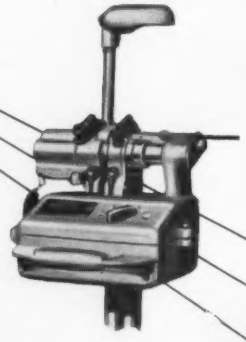
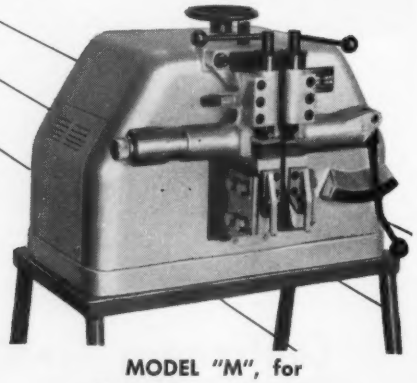
SCHLATTER welders are available with special control equipment to weld high carbon steel.



MODEL "S", for
Steel: .01" - .08" diam.
Copper: .01" - .072" diam.



MODEL "E", for
Steel: .04" - .32" diam.
Copper: .04" - .25" diam.



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Copper: .16" - .37" diam.

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- Modern Electronic Controls

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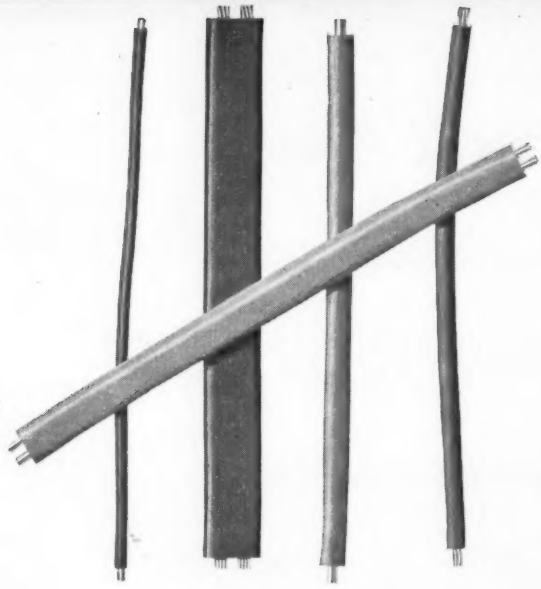

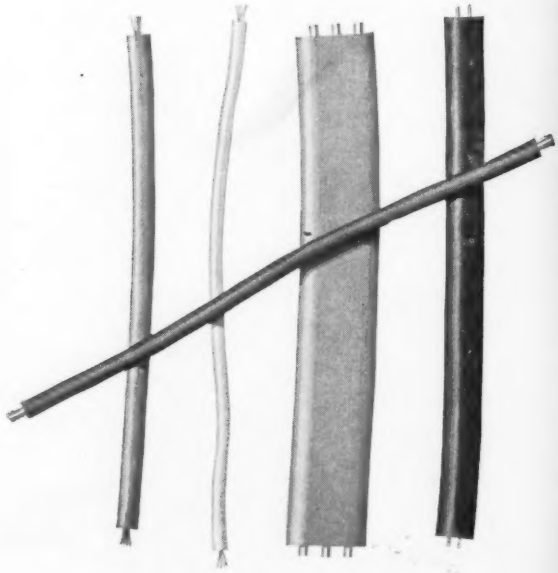

OPALON® 1038 vinyl compound meets 15 insulating and jacketing specifications*

Monsanto Opalon 1038 fills so many applications, it can streamline your inventory. It combines excellent extrudability, high insulating qualities, great heat resistance and toughness even after long use under rigorous conditions. If you need to meet any of the specifications listed below, write for 1038 data to Monsanto Chemical Company, Plastics Division, Room 752, Springfield 2, Mass.

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U.L. T, TW, and 60° C. oil exposure on both copper and aluminum conductors.

U.L. underground feeder and non-metallic sheathed cable (UF-NMC).

Class 11, U.L. standard for flexible cord and fixture wire insulation and jacket.

IPCEA Appendix I.

ASTM D-734.

MIL-W-76A, Types LW, MW, and HW.

U.L. 80° C. appliance wire.

***JACKET**

ASTM D-1047 (Passes -40° C. cold bend).

UF-NMC.

REA Spec. PE-14.

IPCEA, Appendix J.

IMSA, Spec. 19 and 20.

Inside-outside telephone cable (Staple Gun Wire).

Jan-C-17A Type I.

MIL-C-15479A (Harbor Defense).

Roebling Tire Bead Wire: Packaged for Maximum Benefit

The problems eliminated by this unique reel-less core packaging system are manifold. Loads are palletized two cores per pallet and may be stacked two or three high. This, plus the fact that you need not accumulate empty reels means storage space requirements are cut to *less than half*. You do away with all freight and handling costs on reels, the bother and expense of "bookkeeping" returnable reels, and the freezing of money in reel deposits.

This is typical of Roebling's advanced packaging methods—that makes handling Roebling high-quality wire so much easier. For details on this efficient Roebling Tire Bead Wire packaging method, or information on other types of Roebling wire, write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.

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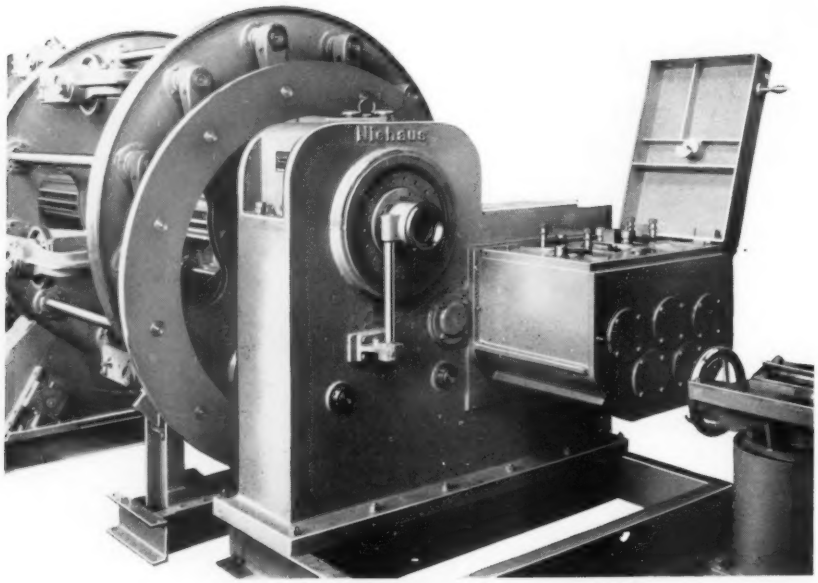
NIEHAUS

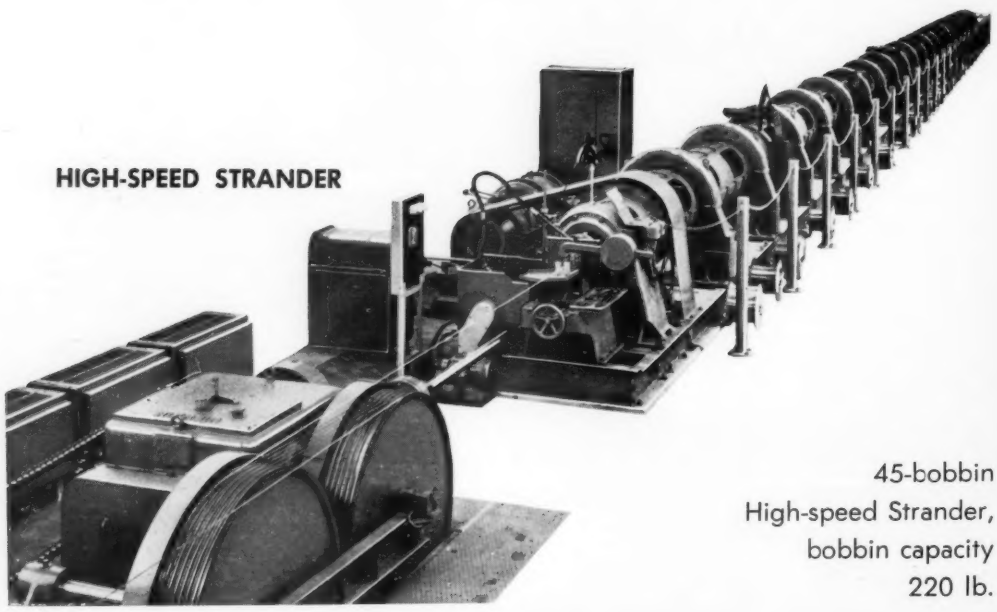
ELECTRIC-CABLE MACHINERY • WIRE-ROPE MACHINERY

PLANETARY STRANDER



We manufacture: Stranding and Rope-closing Machines of tubular and planetary design, of any size and for any number of bobbins, as well as the pertinent auxiliary machinery and equipment.

HIGH-SPEED STRANDER



45-bobbin High-speed Strander, bobbin capacity 220 lb.

MASCHINENFABRIK K. A. NIEHAUS • DUSSELDORF-RATH

Sole Representative: Paul Reicher Machinery & Equipment, Ltd., 600 Eglinton Ave., East, Toronto 12, Ont., Canada

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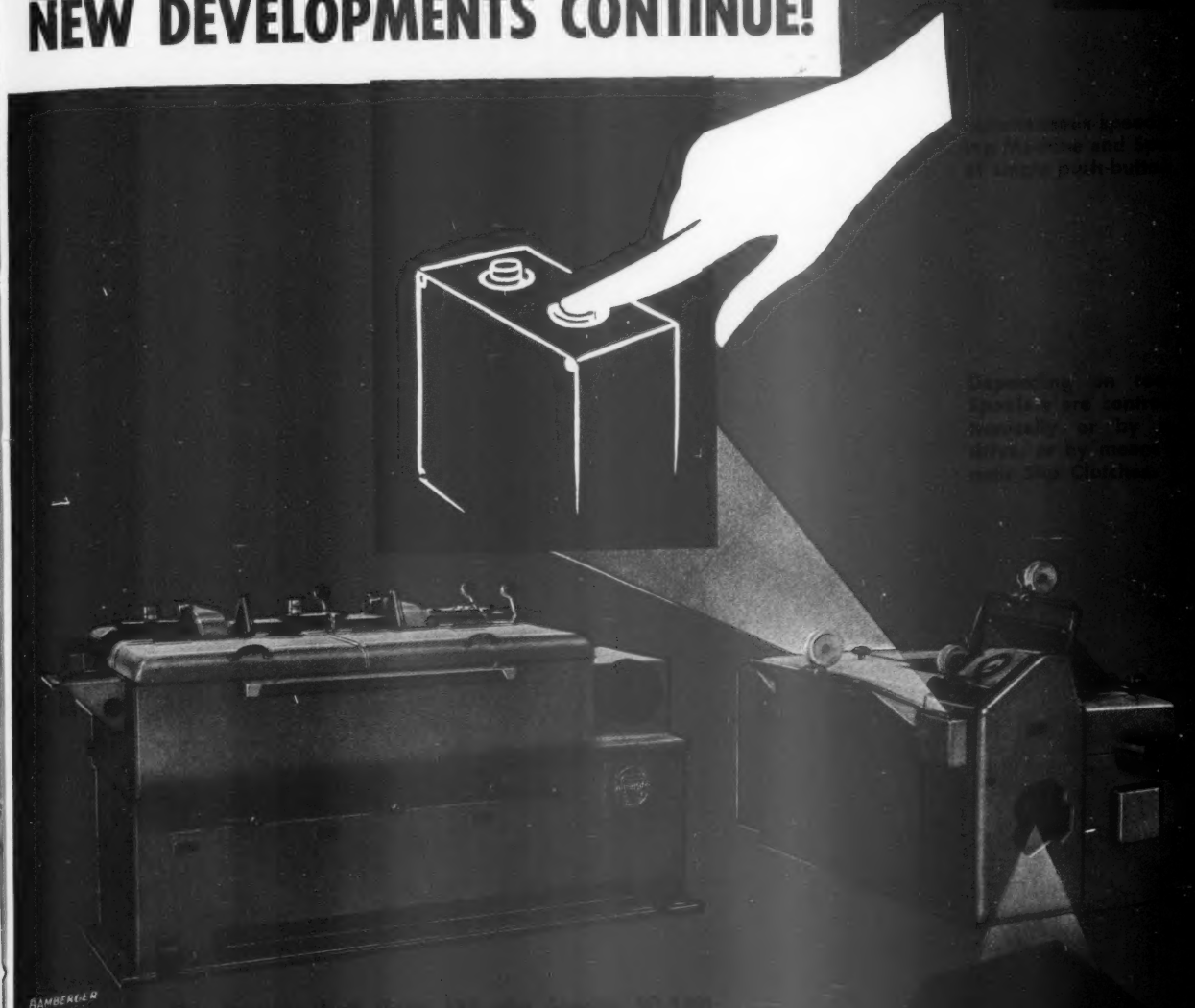
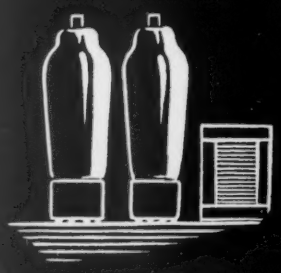
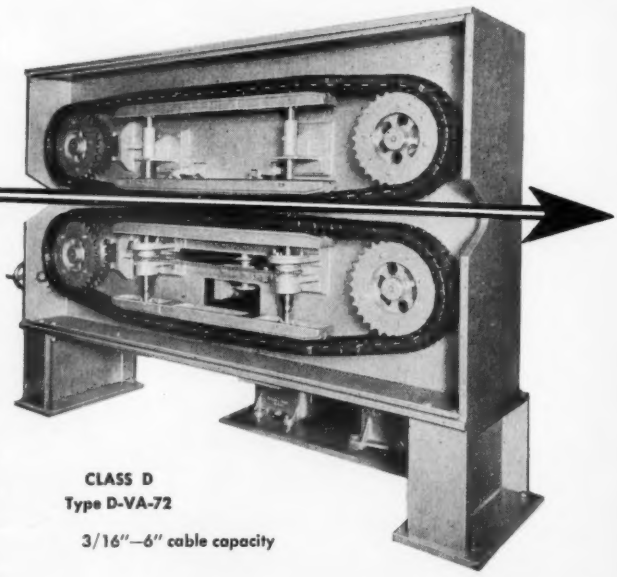




HAVE YOU TRIED

STRAIGHT PULL



CLASS D
Type D-VA-72
3/16"—6" cable capacity

IF NOT . . .

You have been compromising product quality as well as having been subjected to the high initial cost, complex installation, wasted floor space and exorbitant power requirements inherent to drum type capstans.

FOR YOUR NEW INSULATING LINE . . . CONSIDER

CATERPULLER* *by ENTWISTLE*

It is notable that Caterpuller, including drive, costs less and requires no special pit or foundation. In addition to these savings, undue flexing of cables is eliminated, while heavier pulls are possible with less horsepower.

The D-VA-72 Caterpuller, pictured above, is a prime example of the many fine types of Caterpullers by ENTWISTLE covering a wide range of applications. Without obligation, write for Specification No. 16.

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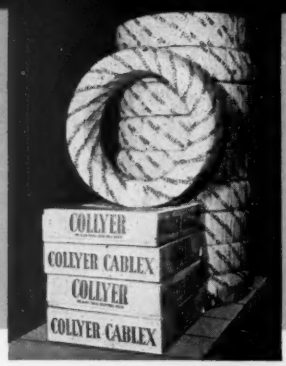

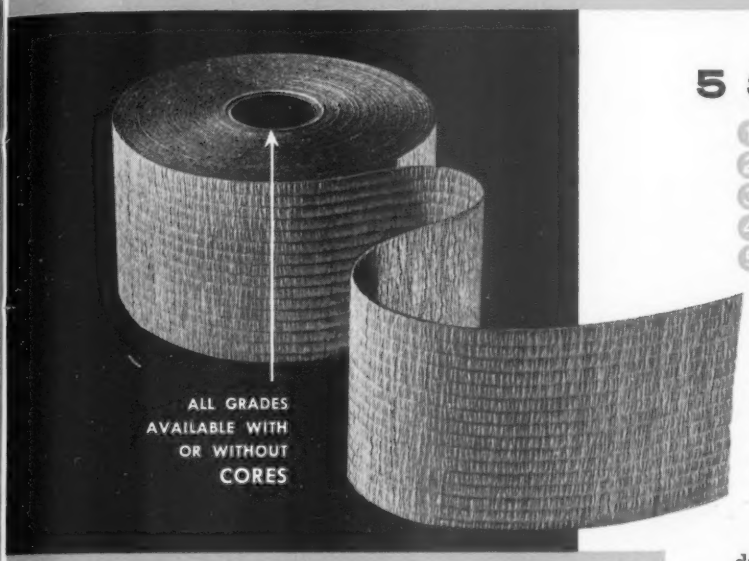

5 STANDARD GRADES

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4. BLOND LAMINATED — REINFORCED
5. CREPED KRAFT (Plus Custom Grades)

Featuring Thilco's NEW LONGITUDINAL PLEATING

New, exclusive Thilco LP (Longitudinal Pleating) provides two-way stretch, adds approximately 20% more lineal foot yield to Standard creped grades. This added footage per roll increases machine coil wrapping efficiency by 20% — cuts downtime by reducing the number of roll change-overs, and saves another 20% on storage space. LP increases wrapper flexibility and is especially advantageous for packaging small circumference coils. All Thilco Coil Wraps are available *with* or *without* pleating in standard widths 3" to 5½" or in special widths to order. All can also be trade-mark Print Decorated. Write for details.

NEW CREPED WEIGHTS

Now available in basis weights up to 80 lb./50 lb./60 lb. laminated (50% heavier than previous available weights) or 90 lb. Single-Ply, creped up to 50% stretch.

NEW PALLET LOAD "PUT-UP"

Saves Handling Costs — Increases Efficiency by 20%

Thilco Coil Wraps are compactly stacked on pallets, spindled on dowels at corners, interleaved with Thilco heavy-duty Kraft at 4-roll layer intervals to reduce shifting, then wrapped with an abrasion resistant, water-proof Thilco WRAP-DRI paper blanket which produces a sturdy, weather-resistant packaged unit. This new "pallet packing" method reduces handling costs, saves approximately 20% on storage space, provides immediate on-sight inventory and increases efficiency generally. There are many other advantages you'll want to learn about.

THILCO PAPERS INCLUDE:

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- **SPECIAL BAGS** and case liners

Write for Thilco Brochure containing Coil Wrap Samples and complete descriptive information.

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BUILDING-BLOCK FLEXIBILITY. 6"x6" transistor control panels permit adding and removing of circuits in your plant by your own electrician.
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DEPENDABLE TRANSISTORS. Rated 35 volts, but stressed to only half their normal rating. Unusually high gain with twice the speed of response and only half the drift in gain of tubes. Transistors never fade —normally provide 15 or more years of service.

The New LOUIS ALLIS Select-A-Spede® Drive —First with field-proved All-Transistor Control

a high-gain, high performance d-c drive with unmatched flexibility and low upkeep

Here's a superior adjustable speed drive with simplified transistor-magnetic amplifier control. It's the easiest drive to set up and operate. A twist of the dial gives you stepless speed adjustment from zero to full speed in either direction. Each adjustment is independent, thus sparing you the need for compensating adjustments of inter-related settings. You get more consistent day to day operation because transistors — *unlike tubes* — are highly dependable.

The new Select-A-Spede defies obsolescence. To add functions you simply have your electrician install any of 13 "building-block" control circuits as your conditions require. These circuits come on inexpensive 6" x 6" panels ready for installation and are immediately available from Louis Allis stock. Thus a rebuilding or adaptation job that, on former equipment, cost thousands of dollars — excluding downtime — can now be done at a fraction of the cost and time *right in your own plant!* High quality transistors, field proven in missiles and other advanced electronic equipment, assure you of a high degree of dependability with a life expectancy of 15 or more years. Printed low-voltage transistor circuits are virtually trouble-free and can be quickly and easily replaced from low-cost stock.

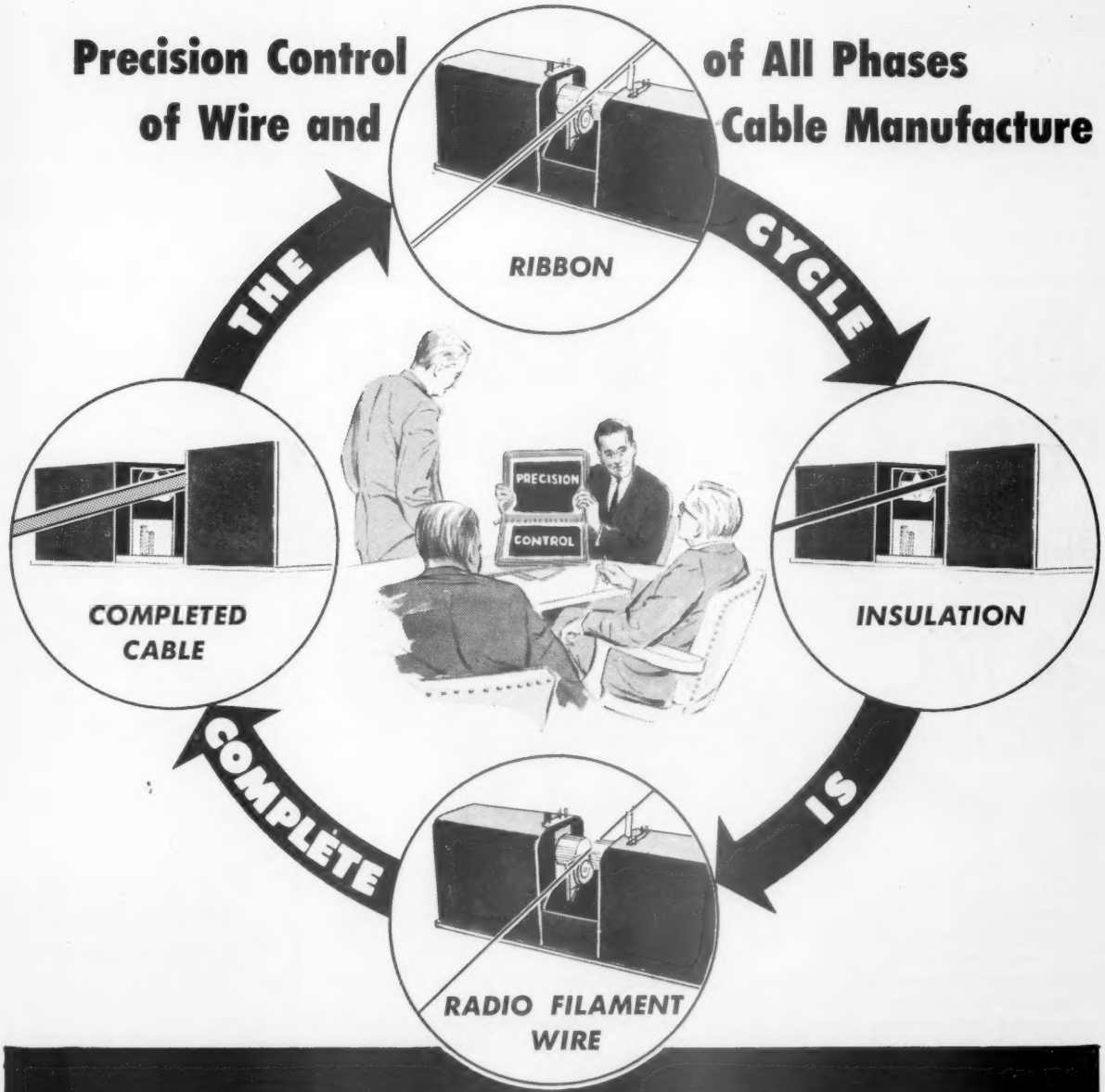
Further savings are provided by the new Louis Allis Flexitorq® drive motors through vastly improved commutation, low brush wear, and their ability to safely withstand momentary overloads of 400% of normal horsepower rating.

Select-A-Spede sizes from 5 to 400 hp, speed ranges up to 20:1. Contact any one of the 60 Louis Allis District Offices for information and application assistance. Or write for bulletin 2001 to The Louis Allis Co., 451 E. Stewart Street, Milwaukee 1, Wisconsin.

LOUIS ALLIS

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

Precision Control of Wire and Cable Manufacture of All Phases



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DIAMACONTROL:

- Designed to measure silk filaments unwinding from a cocoon —
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- NOW returns to Micromeasurement in the field of heater filaments.

Wherever accurate measurement and control of diameters or widths are desirable and essential, the *DIAMCONTROL* is a must on:

WIRE - CABLE - COATED FILAMENTS . . .

Exacting specifications can be met with the DIAMACONTROL. We shall be pleased to supply detailed data and arrange a demonstration.

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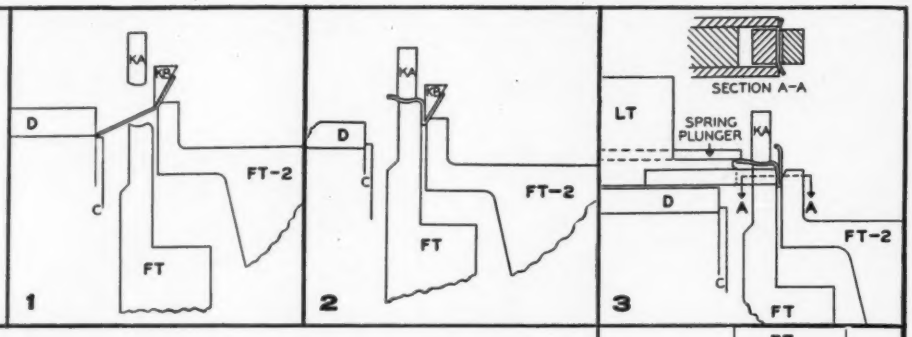
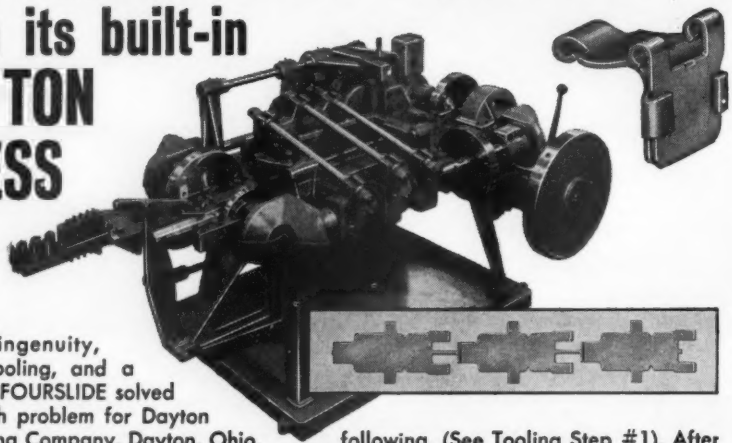
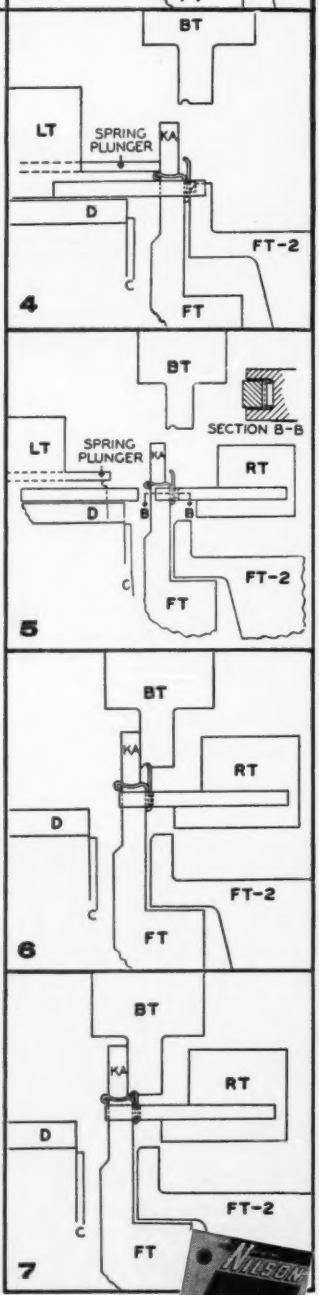
KA King Post Tool
KB King Post Tool Inserted
FT Front Slide Tool
FT2 Front Slide Tool #2
RT Right Slide Tool
LT Left Slide Tool
BT Back Slide Tool
C Cut-Off
D Cut-Off Die



JOB SHOP MAKES COMPLEX PIECE IN ONE OPERATION

on a NILSON S-3-F FOURSLIDE with its built-in 20 TON PRESS





Design, ingenuity, simple tooling, and a NILSON FOURSLIDE solved this tough problem for Dayton Coil Spring Company, Dayton, Ohio. They put this job on a NILSON S-3-F for speed and economy of tooling, instead of in their stamping department.

They benefited first by getting into production faster than possible with complicated cams and progressive dies necessary to do the same job. Second, even though the part is complex, the FOURSLIDE tooling is simple and comparatively inexpensive. Third, the entire piece is formed completely in one machine, resulting in equipment and manpower savings.

The built-in 20 Ton Press produces blanks, from .025" x 1.125" cold rolled ribbon steel, which are continuously fed into the FOURSLIDE tooling area, where the first blank is cut off from the one following. (See Tooling Step #1). After the 6 additional steps shown here, the piece is completed and ejected. SEVEN MODELS of NILSON ribbon metal forming FOURSLIDES are available with various speed ranges between 32 to 204 parts per minute, stock widths up to 3½ inches, and with built-in press sections ranging from 5 to 75 tons capacity.

Many of these production savings can be yours when you consider every metal stamping and wire forming job as an opportunity to save time and dollars with a NILSON FOURSLIDE MACHINE.

Remember — it's usually simpler to tool a FOURSLIDE, it's certainly faster, the economy is startling, and you'll do stamping jobs in one operation that you didn't think could be done.

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Write today for the NILSON FOURSLIDE Catalog No. 62.

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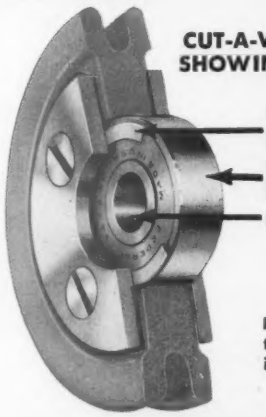
WITHSTANDS HI-SPEED PRESSURE OF SYNTHETIC YARNS AND WIRE WITHOUT WEAR OR DAMAGE

HEANIUM®
PU2-F PULLEY

CAN BE RUN AT TEMPERATURES ABOVE 200 F. WITHOUT BEARINGS LOOSENING IN PULLEY.



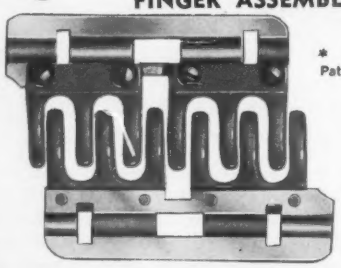
Heanium® Pulleys outwear their bearings, but the bearings are easily replaced.

HEANIUM TENSION FINGERS AND PIGTAILS FOR TENSION ASSEMBLIES ELIMINATE YARN DAMAGE

A few of the most common types of HEANIUM® Guides are shown below. Many other designs and sizes are available incorporating the natural wear resistance of this versatile material.

If guide wear is a problem in your mill . .

try HEANIUM T-3-F FINGER ASSEMBLIES*

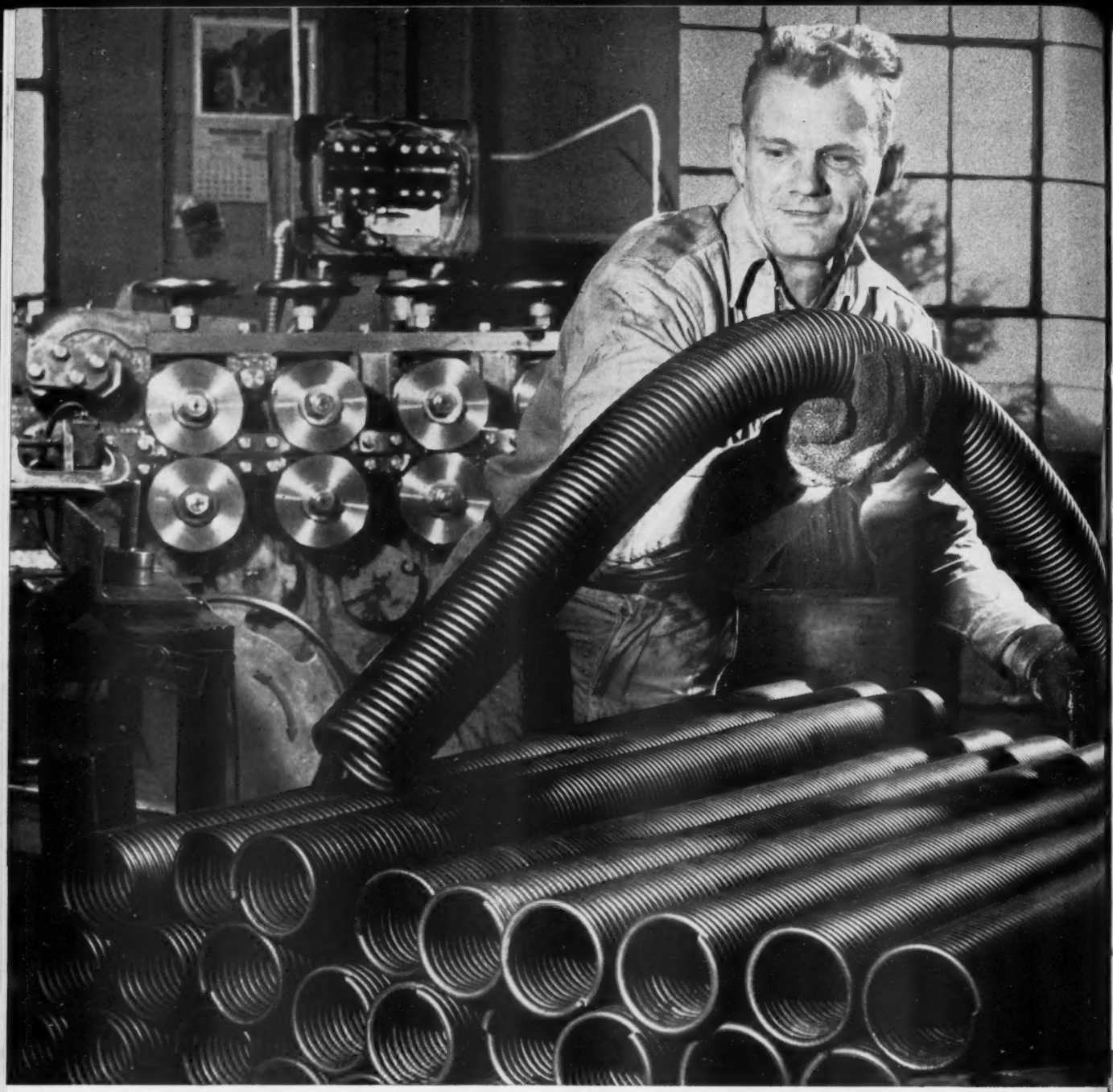


* Patented

Whenever you are confronted with a guide problem our Engineering Department will be glad to work with you in arriving at the best solution. Whether your problem calls for an entirely new design or the re-designing of an existing guide, feel free to call on us for help. Custom made samples can be furnished to your specifications.

If guide wear is a problem in your mill . . **USE HEANIUM®**

HEANY INDUSTRIAL CERAMIC CORP.
P. O. BOX 530 NEW HAVEN 3, CONNECTICUT



Torsion springs for Crawford Door Co.'s Marvel-Lift garage doors are coiled from Pittsburgh Steel Co.'s Oil Tempered MB Wire, from wire .168 inch to .468 inch in diameter.

How Pittsburgh Steel's Wire Makes . . .

Springs That 'Rate'

Crawford Door Co. Depends on Uniformity of Pittsburgh Steel Wire For Precise Engineering of Marvel-Lift Garage, Industrial Doors

Torsion springs which operate Crawford Door Company's garage and industrial doors have to "rate." Here, rate means the force stored up in the spring to supply power for smooth, efficient, finger-tip raising and lowering.

The rate built into any spring—from a 42½-inch long spring on a single car Marvel-Lift residential garage door to a 12-foot long spring on an industrial door—depends on uniformity of wire diameter.

Lack of uniformity throws off engineering calculations and spoils spring performance. Let Elliott Koepfgen, chief engineer for Crawford Door, explain how uniformity of Oil Tempered MB Wire supplied by Pittsburgh Steel Co. helps him design torsion springs to meet pre-determined rates:

"Each of our springs is made to meet a definite rate. This rate is the

torque which can be exerted in one turn of the spring. It provides the force stored up in the spring to operate the doors. By calculating the diameter of the wire, the number of coils and the number of turns the spring is turned back against itself, we can design a spring with the rate we know is necessary to lift a door of a certain weight and height.

"Uniform diameter is a must since variations would drastically affect spring performance. Uniformity helps us design efficient springs which will last the life of the door. If we overbuild the spring we run up production costs. If we underbuild, we get failures in service and customer dissatisfaction.

"Pittsburgh Steel supplies us Oil Tempered MB Wire we can count on to be so uniform that we can treat wire diameter as a known factor in our engineering calculations."

Oil Tempered MB Wire from Pittsburgh Steel Co.'s wire mills is checked at Crawford Door plant by M. J. Duffy, plant manager, left, and W. D. Williams, Pittsburgh Steel Co. salesman.

Here's how it works in two typical designs: for an eight-foot high, 128-pound door in a single car residential garage, Mr. Koepfgen specified a spring made from .263-inch diameter wire. The wire was coiled into a 14.5-pound spring 42¼ inches long with 160 coils. Because the wire was uniform in diameter, each spring made to these specifications had a rate of 60 when the springs were turned back on themselves 7 turns each.

Or take a large industrial door application. For a specially engineered door 12 feet high and weighing 654 pounds, Mr. Koepfgen specified a spring made of .468 wire. The spring was 78¾ inches long, weighed 234 pounds and had a rate of 271 when the spring was turned back 7¼ turns. Because of uniformity in wire diameter, the spring and door combination worked perfectly after installation.

• **Buys 23 gages**—Crawford Door Co. relies on Pittsburgh Steel Co. for oil tempered wire in 23 gages, ranging from .168 inch in diameter for springs 26 inches long to wire .468 inch in diameter, used to coil springs up to 14 feet long.

Uniformity of diameter isn't the only requirement. Crawford Door also insists upon, and gets from Pittsburgh Steel Co., wire with these qualities:

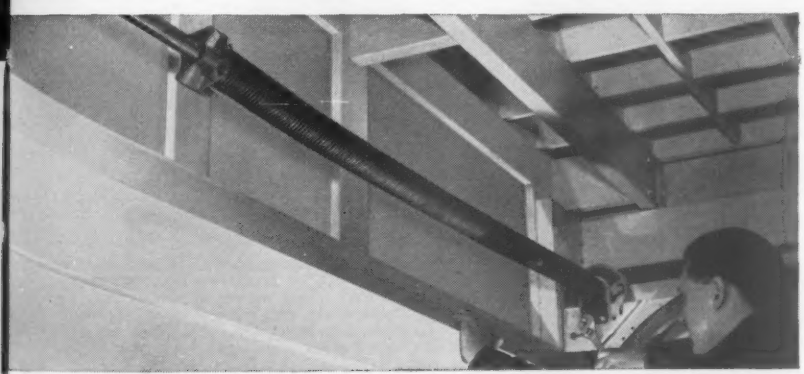
1. **Fatigue strength**—Springs must have long life without taking a set since garage doors are expected to last indefinitely even in busy places like gasoline service stations.

2. **Coilability**—Automatic coiling machines can't operate efficiently or economically unless the wire runs through the coilers smoothly. So Crawford wants a good surface free from defects.

3. **Proper Temper**—Oil tempering and heat treating at the wire mills of Pittsburgh Steel produce wire free from soft and hard spots so that wire can be coiled without bulges which affect performance and shorten spring life.

Plant Manager M. J. Duffy says Pittsburgh Steel supplies wire in shipment after shipment which "gives consistently good results without slowing production or piling up rejects."

Whatever your requirements for manufacturers' wire, whether you're making bobby pins or springs, you'll benefit from the skill and mill facilities which produce wire tailor-made to this customer's specifications. A mill-trained representative is as close as your telephone to help you solve your wire problems or show you how Pittsburgh Steel Co. wire can help reduce costs while improving your product. Call a Pittsburgh man today in the nearest district office.



Installation on garage door. Spring is turned back on itself the calculated number of times and mounted on tubular shaft running width of door. Cables fastened to drums at each side of shaft raise or lower doors. When door is lowered, door weight winds up spring, storing power to be used in raising the door. Lift is applied to both sides of door so it raises evenly, gliding upward in absolutely level position.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

WE ARE PROUD OF THE COMPANY(S) WE KEEP (happy that is...)

KENNECOTT WIRE AND CABLE
UNITED STATES STEEL
MID-STATES STEEL AND WIRE
KAISER ALUMINUM
BELDEN MANUFACTURING COMPANY
BRIDGEPORT BRASS
CONTINENTAL STEEL
INTERNATIONAL NICKEL
BRODERICK AND BASCOM ROPE COMPANY
STEEL COMPANY OF CANADA
SIMPLEX WIRE AND CABLE
LACLEDE STEEL
BETHLEHEM STEEL
B. GREENING WIRE COMPANY
JONES & LAUGHLIN
NEHRING ELECTRICAL WORKS
B. F. GOODRICH COMPANY
COPPERWELD STEEL
AMERICAN CHAIN AND CABLE

Our roster of distinguished users of Micro-Welders reads like the Blue Book of American Industry.

Ask THE FIRMS WHO USE MICRO-WELDERS

. . . for continuous butt welding of ferrous wire, sizes .005″ to 1.250″

. . . for continuous butt welding of non-ferrous wire, sizes .010″ through 1.000″. . .

They will tell you that Micro-Welders are

- **Easy to Operate**
- **Durable**
- **Economical**

MICROMETER PRECISION — MICRO-WELD — TRADE MARK REGISTERED

OUR 30 YEARS OF EXPERIENCE IN THIS HIGHLY SPECIALIZED FIELD ARE AT YOUR COMMAND . . .

MICRO PRODUCTS CO.

MODEL S.E.M.T.
For Welding All Types of Fine Wire Aluminum, Copper, Brass, Bronze, Steel and Steel Alloys, sizes .005″ to .020″

Model S. E. M. T. is equipped with a temperature-indicating device for annealing and tempering, voltage regulator and meter to compensate for voltage fluctuations, wire cutters, extra large magnifying glass, fluorescent light and extension cord. Can be supplied for bench-mounting or mounted on 4-wheel truck.

Model A. C. M. T., similar in design, covers capacities from .010″ to .062″.

20 NO. WACKER DRIVE
CHICAGO 6, ILLINOIS
TELEPHONE STate 2-7468

Announcing the NEW HUD-PAK®

HIGH SPEED WIRE PAYOFF PACKAGE

Are You Looking For High Quality Bare Or Coated Wire In The Most Modern Up-To-Date Package?

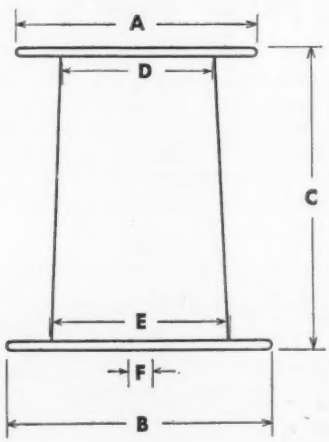
- **High Speed Payoffs.**
- **Controlled Tensions For Single And Multiple End Winding Operations.**
- **Large Payoff Packages.**
- **A Rugged Container To Protect Wire In Use Or Storage.**
- **Instantaneous Starts And Stops.**
- **All At Regular Wire Prices.**

The exclusive new HUD-PAK is the most important money-saving development in wire packaging in 20 years. With many conductor and AWG sizes, users report record payoff speeds in excess of 4000 feet a minute. HUD-PAK reduces waste from short spools. Its tapered barrel spool—and absence of inertia found with rotating spools—permit instantaneous starts and stops with no danger of wire shakedown and tangle.

We are currently supplying HUD-PAKS containing bare copper wire, tin plated, silver plated, and aluminum wire. Other types are being developed. Maximum weights for copper are approximately 120 pounds from 38 AWG to 18 AWG. A 35 pound HUD-PAK will soon be available to handle materials and sizes now offered in the larger HUD-PAK, as well as finer AWG sizes.

For information concerning magnet wire on the HUD-PAK, write or phone Hudson Wire Company, Magnet Wire Division, Winsted, Conn. Cassopolis, Mich.

The term "HUD-PAK" is a trade-mark of Hudson Wire Company.



	A	B	C	D	E	F
HUD-PAK 120	10"	11"	12½"	6½"	7½"	1¼"
HUD-PAK 35*	8½"	9½"	9"	6½"	7½"	1¼"

*Available soon.

CAPACITIES

MATERIAL	Approx. Weight (lbs.) 120	35
COPPER	120	35
CADMIUM COPPER	120	35
ALUMINUM	37	11
BRASS 70/30	115	34
PHOSPHOR BRONZE	120	35
NICKEL SILVER	115	34
STEEL	107	31

HUDSON WIRE COMPANY
OSSINING DIVISION, OSSINING, NEW YORK
TELEPHONE: WILSON 1-8500

SEE THE "HUD-PAK" DEMONSTRATED IN OUR SHERATON HOTEL SUITE AT THE WIRE ASSOCIATION'S PHILADELPHIA MEETING, MAY 4-5.

NOMINAL WEIGHTS OF FINISHED WEATHER RESISTANT WIRE AND CABLE
Copper & Copper Alloy Conductors
Aluminum Conductors
Conductor Size AWG or Mcm
URC Type Double Braid
URC Type Triple Braid
Neoprene Type
Polyethylene Type
Neoprene Type
Polyethylene Type
Stranded
Solid
This table shows
POLYETHYLENE covere
I HAD THE BOSS UP A POLE...
DON'T GET ME WRONG...I STILL DON'T LIKE STORMS
"But they don't seem to hit us so hard any more.
Not since polyethylene coated wire came along."

TELLING THE POLYETHYLENE WIRE STORY CAN BUILD FUTURE PROFITS FOR YOU

Polyethylene-covered line wire has many advantages for users: Exceptional weather and stress-crack resistance. Easy handling and installation. Long life in service. Fewer outages and minimum maintenance.

We've been telling your customers the polyethylene story in utility magazines through advertisements like those above. And more and more users are specifying polyethylene covering for line wire and many other applications. Why not join us in this effort?

Polyethylene can make your operations simpler, with a more profitable future too.

- The resin comes ready-to-use — nothing to add, no blending, no milling, no post-extrusion vulcanizing. With production based completely on polyethylene, one line replaces several, providing savings in equipment, floor space, maintenance and labor. And there's only one material to purchase and inventory.
- Unlike costs of other insulating materials, which are trending upward, polyethylene price history promises long-term stability. This means polyethylene can be expected to be your most profitable line wire coating in the years ahead.

You can build a solid base for future sales and increased profits by promoting polyethylene line wire now among your customers and prospects.

As you make recommendations, you will find our new data sheet, "PETROTHENE® Resins for Wire and Cable Industry", helpful in selecting resins with the proper balance of properties for different applications. Also available is U.S.I.'s comprehensive 100-page "PETROTHENE Polyethylene . . . A Processing Guide." Write for your copies.

U.S. Industrial Chemicals Co.
Division of National Distillers and Chemical Corp.
99 Park Ave., New York 16, N. Y.

Please send me:

☐ "PETROTHENE Resins for the Wire and Cable Industry"
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U.S.I. INDUSTRIAL CHEMICALS CO.
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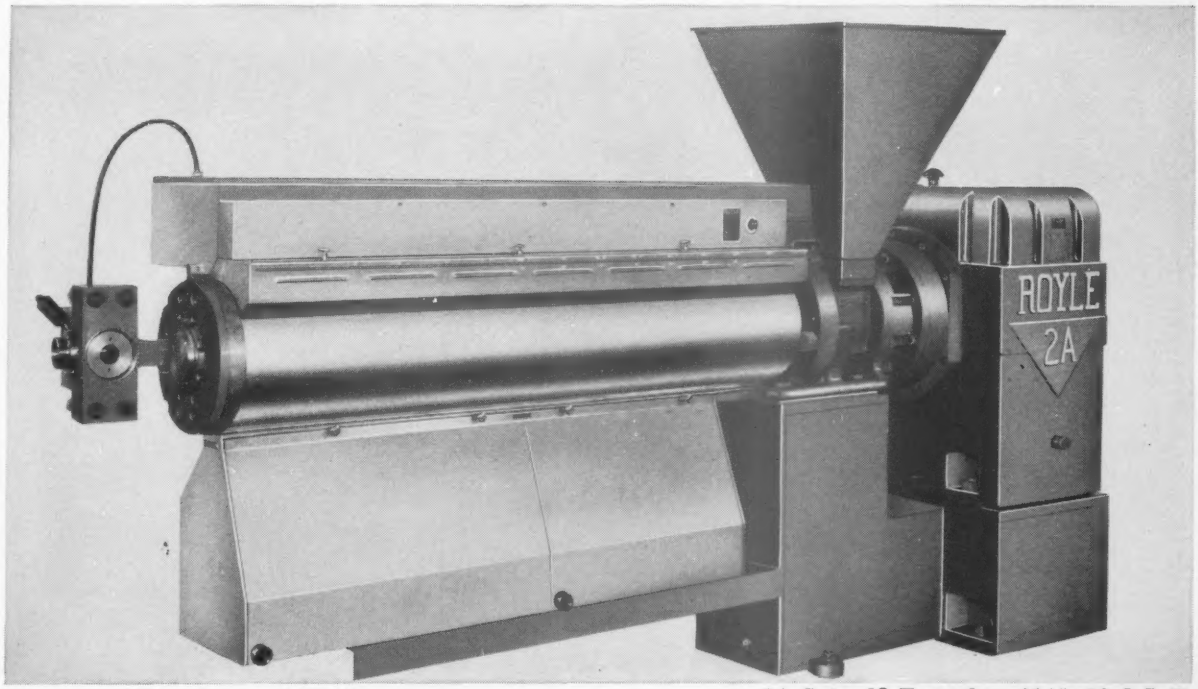
ROYLE

the world's most popular thermoplastic wire extruder



2A Spirod® Extruder, 4½", 20:1 L/D

MORE ROYLE EXTRUDERS ARE IN USE IN THE WIRE INDUSTRY THAN ANY OTHER MAKE

And with good reason. Whatever your requirements for Thermoplastic Wire—Telephone Wire, Building Wire, High-Voltage Cable, Specialty Wire—Royle has the completely engineered Extruder and Auxiliary Equipment exactly suited for your particular needs . . . for fast, economical production of high quality wire.

Royle Spirod® Extruders have the heating and cooling capacity to process all of the latest Thermoplastic compounds. Even Teflon 100-X—that highly corrosive compound—is being processed daily on many Royle Spirod® Extruders.

Royle Auxiliary Equipment for Thermoplastic Wire extrusion includes:

Engineered Capstan Systems
Controlled Cooling Systems
Take-ups
Air Wiper Assemblies
Dry Blend Hopper-Screw Seals
Auxiliary Feed Hoppers

ROYLE
Paterson, N. J.

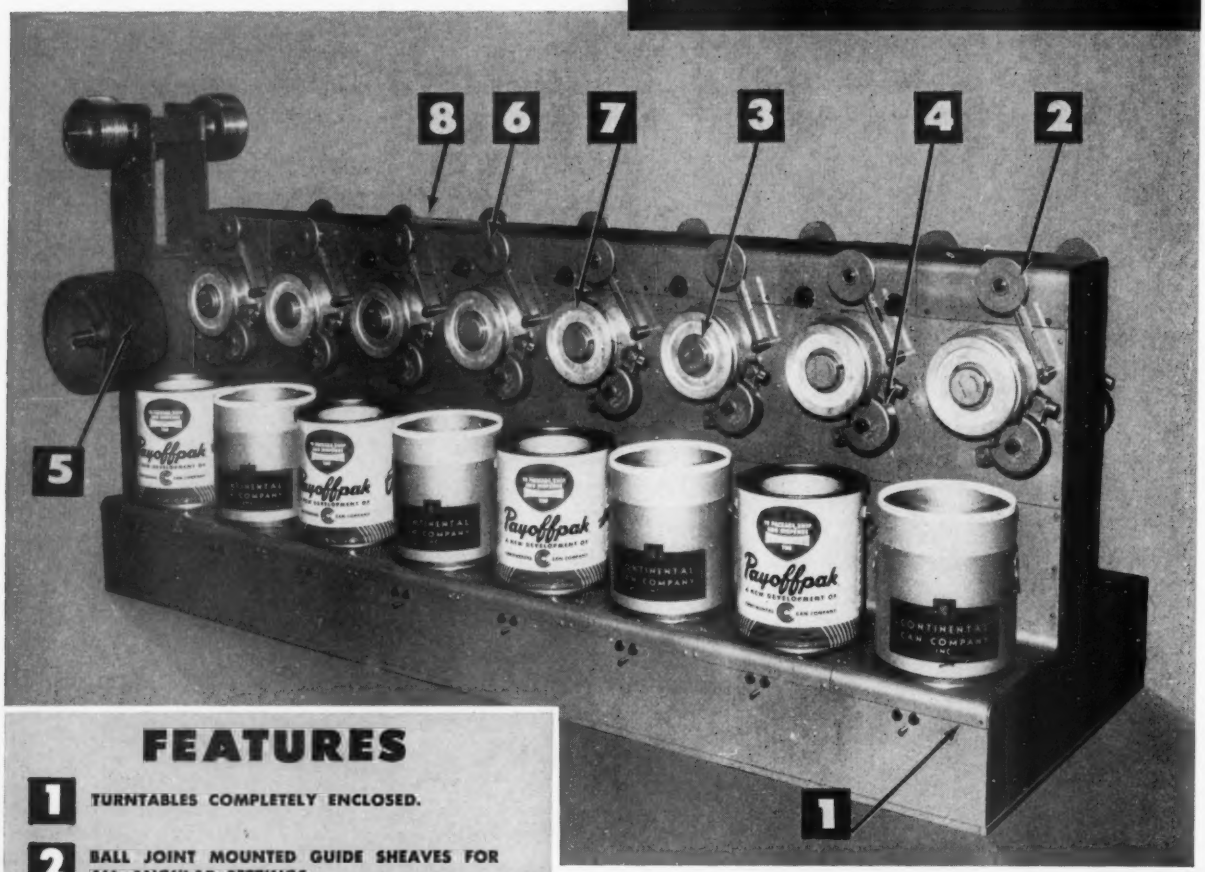
JOHN ROYLE & SONS

John Royle & Sons, 10 Essex Street, Paterson 3, New Jersey

Pioneered the Continuous Extrusion Process in 1880

Home Office, V. M. Hovey, J. W. VanRiper, SHerwood 2-8262. Akron, Ohio, J. C. Clinefelter Co., BLackstone 3-9222. Downey, Cal., H. M. Royal, Inc., TOpaz 1-0371. London, England, James Day (Machinery) Ltd., Hyde Park 2430-0456. Tokyo, Japan, Okura Trading Company, Ltd., (56) 2130-2149.

ANNOUNCING the WYREPAK



FEATURES

1. TURNTABLES COMPLETELY ENCLOSED.
2. BALL JOINT MOUNTED GUIDE SHEAVES FOR ALL ANGULAR SETTINGS.
3. ELECTRO-MECHANICAL TENSION CONTROL FOR EACH HEAD.
4. PRECISION GROUND PRESSURE ROLLS.
5. PRIME RUBBER LAGGED CAPSTAN.
6. ASSEMBLED AND ALL ADJUSTMENTS MADE WITH ALLEN SCREWS.
7. ALUMINUM CAPSTANS, WITH HARD-ANODIZED, POLISHED RUNNING SURFACES.
8. INDIVIDUAL MAINTENANCE ON EACH SECTION.

The drum packaging Take-Up System illustrated, Model S5-TC-S, was designed especially for Magnet Wire.

Other models are made for all types of ferrous and non-ferrous wires.

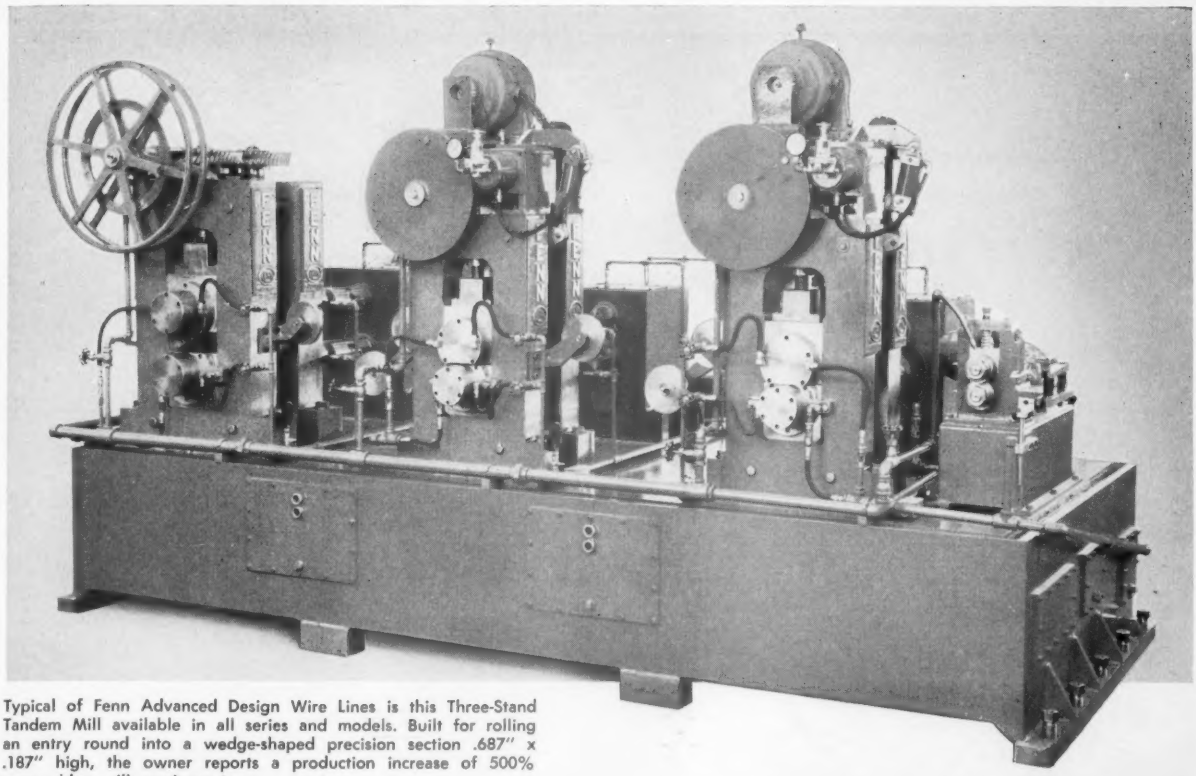
Advanced engineering and precision construction have evolved in this machine new concepts of speed and efficiency in the packaging of wire. Capacity: Min. size — #32 ga.; max. size — #20 ga. wire.

YOU ARE INVITED TO SECURE COMPLETE DETAILS REGARDING THIS ADVANCED PROCESS FROM —

Advanced Wyrepak Co., Inc.

11 HARRISON COURT PHONE: EDison 4-4274 BRIDGEPORT, CONN.

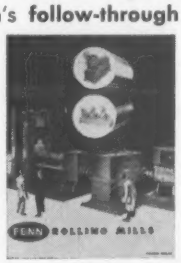
OR The Vaughn Machinery Co., CUYAHOGA FALLS, OHIO



Typical of Fenn Advanced Design Wire Lines is this Three-Stand Tandem Mill available in all series and models. Built for rolling an entry round into a wedge-shaped precision section .687" x .187" high, the owner reports a production increase of 500% over older mill equipment.

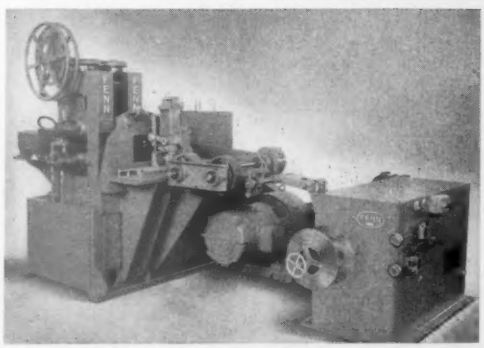
Production proven

When you specify a Fenn Wire Flattening Mill . . . you can do so with confidence. Regardless of its size, number of stands and accessories, its advanced design, precision engineering and construction are all **production proven** in many installations for flattening both ferrous and nonferrous wire to exacting tolerances. Fenn can supply standard mills or lines engineered for your specific or unusual requirements. Important also to the user is Fenn's **follow-through** in your plant during and after installation. Fenn's central engineering department and a nationwide staff of factory-trained field engineers are always at your service. Write for Catalog FRM-58. The Fenn Manufacturing Company, Newington, Connecticut.

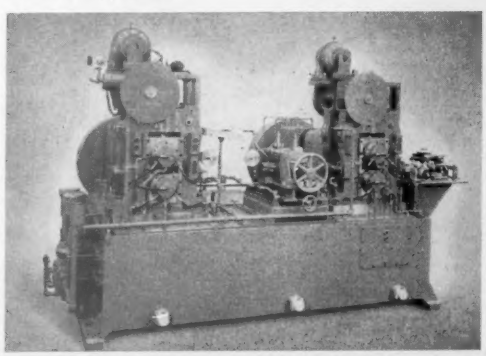


FENN

WIRE FLATTENING MILLS



The popular Fenn 5 in 1 Wire Line is **production proven** for versatility and precision. This compact mill draws, flattens, sizes and edges, sizes and shapes, gages, and bundles, yet occupies as little as 72 square feet of floor space. Costs as low as $35,000 complete. "A best buy" wherever applicable.

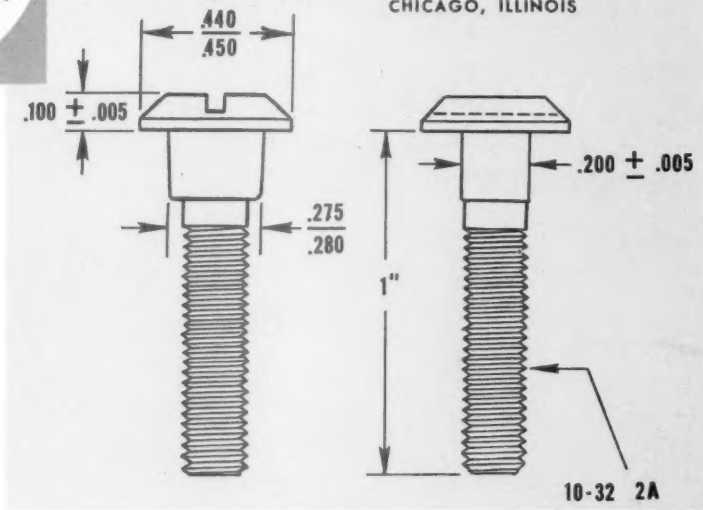


Fenn Two-Stand Tandem Wire Mill with 8" rolls. Equipped, as illustrated, with electric screwdowns, edger and magnetic continuous width and thickness gages. Rolling speeds up to 1200 fpm.

. . . "LITTLE STROKES FELL GREAT OAKS!"
ALKALI IKE
Ben Franklin said it many years ago, and it is equally true today.
The most difficult wire drawing problem can be overcome if sufficient patience, energy and thought are expended upon it.
If we are given the opportunity to work with you, the wire producers, toward the solution of your wire drawing problems, then our combined little strokes can and will fell the great oak of your problem.
It will be our pleasure and desire to meet with you at the Eastern Regional Meeting of the Wire Association to be held in Philadelphia at the Sheraton Hotel on May 4-5.

KEYSTONE XL WIRE STUDY

Revere SCREW & RIVET CORP.
CHICAGO, ILLINOIS



ACTUAL SIZE

heading problems solved *with Keystone XL Wire*

The cold heading of this generator shoulder bolt required extreme flow of material in concentric shapes, two diameters to be struck in one blow. Specifications were a rigid .005 tolerance. Because of the *flowability* characteristics of Keystone "XL" Wire, Revere Screw & Rivet Corp. have been able to produce this complicated fastener at high production rates and economical costs.

Revere president, Sol Gross, credits the uniform size and quality of Keystone "XL" Wire for increasing production, waste elimination and long die life. In fact, a three-fold increase in die life was realized.

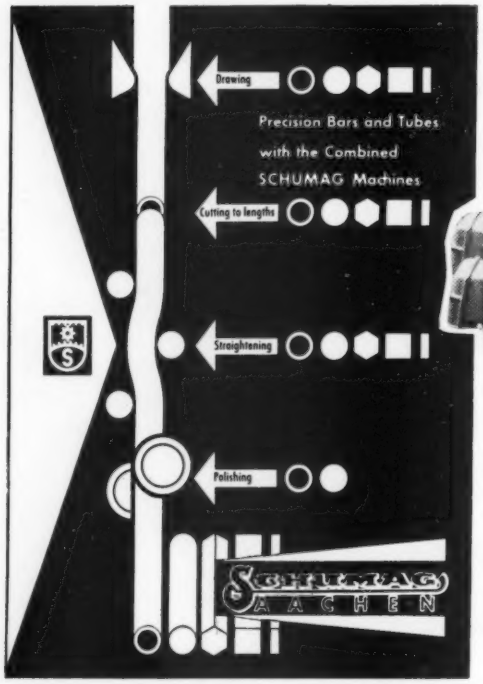
Your cold heading problems can be simplified and solved when you put the *flowability* characteristic of Keystone "XL" Wire through your dies. Ask our Keystone wire specialists for complete information.

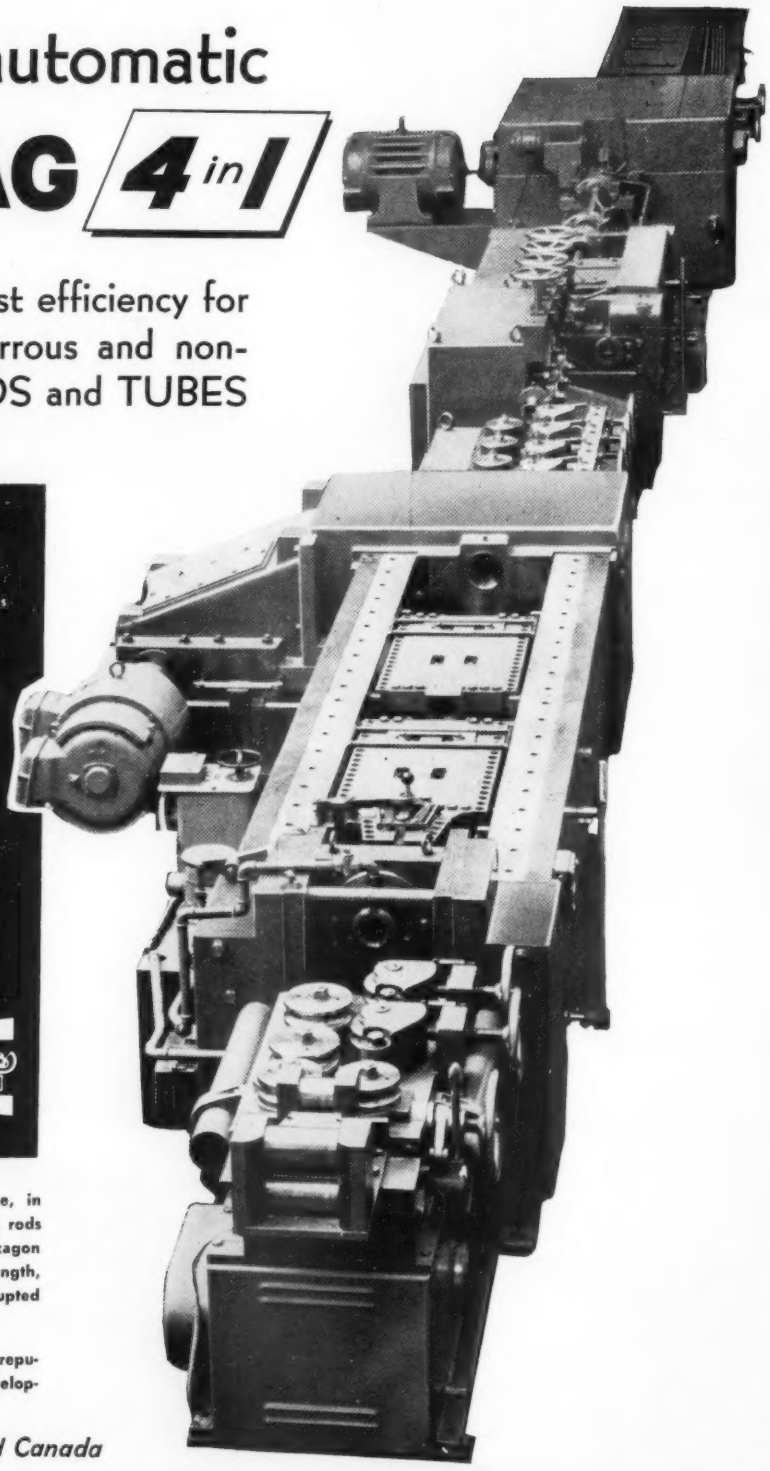
Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE WIRE FOR INDUSTRY

The fully automatic
SCHUMAG 4 in 1

ASSURES... greatest efficiency for manufacturers of Ferrous and non-Ferrous BARS, RODS and TUBES





- SCHUMAG "4 in 1" machines produce, in one continuous operation, finished bars, rods and tubes from round, square or hexagon material. They will finish draw, cut-to length, straighten and polish in one uninterrupted sequence.
- SCHUMAG "4 in 1" enjoys world-wide reputation as the ultimate in technical development.

Exclusive Representatives for U.S.A. and Canada

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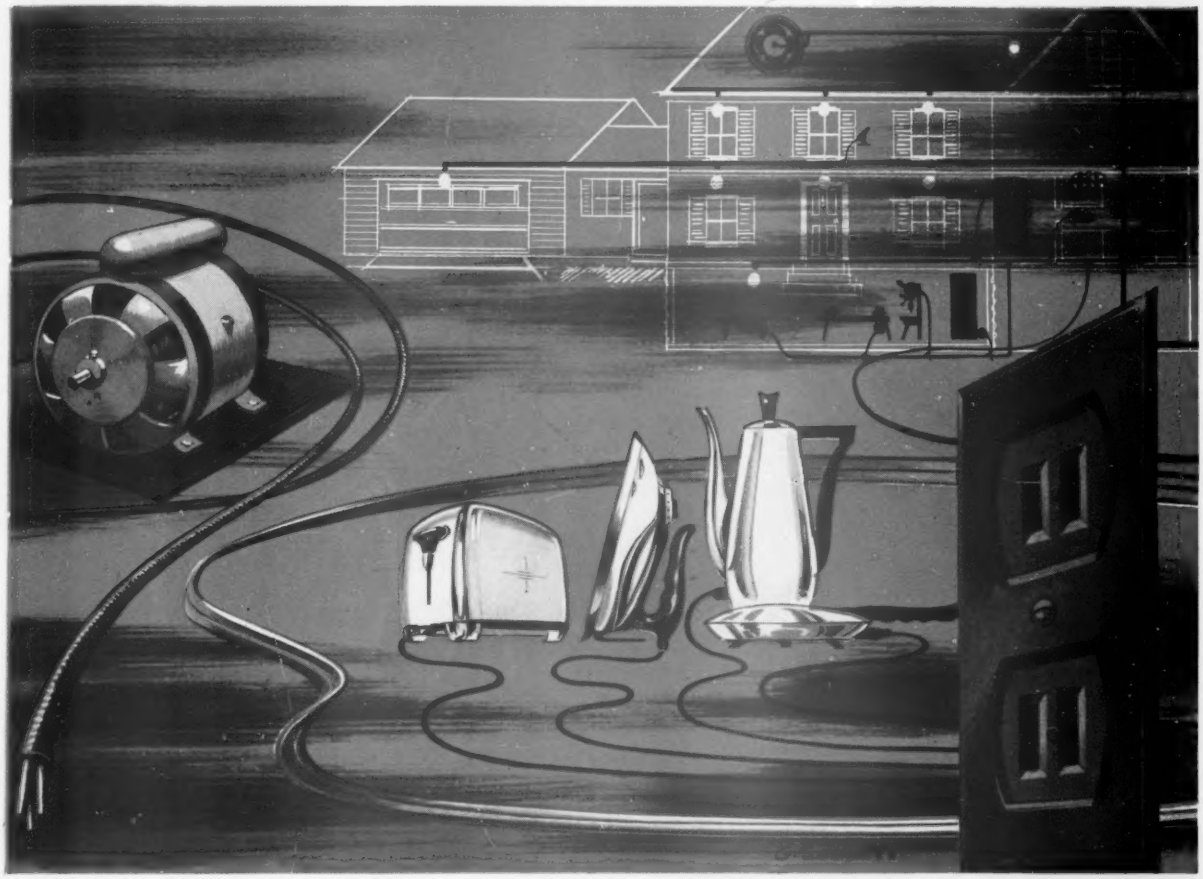
SCHUMAG
AACHEN

Naugatuck MARVINOL

POLYVINYL CHLORIDE RESINS



four resins for electrical application

NAUGATUCK now offers the Wire and Cable Industry *more* PVC resins for insulation extrusion than does any other resin manufacturer.

Two of these Marvinol® resins, VR-22 and VR-23, have UL approval. These resins are, respectively, of high and intermediate molecular weight. Both have good dry blending properties.

Marvinol VR-24 and Marvinol VR-25 are resins of progressively lower molecular weights. They provide high volume resistivity in semi-rigid compounds with little or no plasticizer. Both deserve your careful evaluation for future electrical products.

Check with your Marvinol technical representative for complete data and evaluation samples, or write us on your firm's letterhead.

US RUBBER

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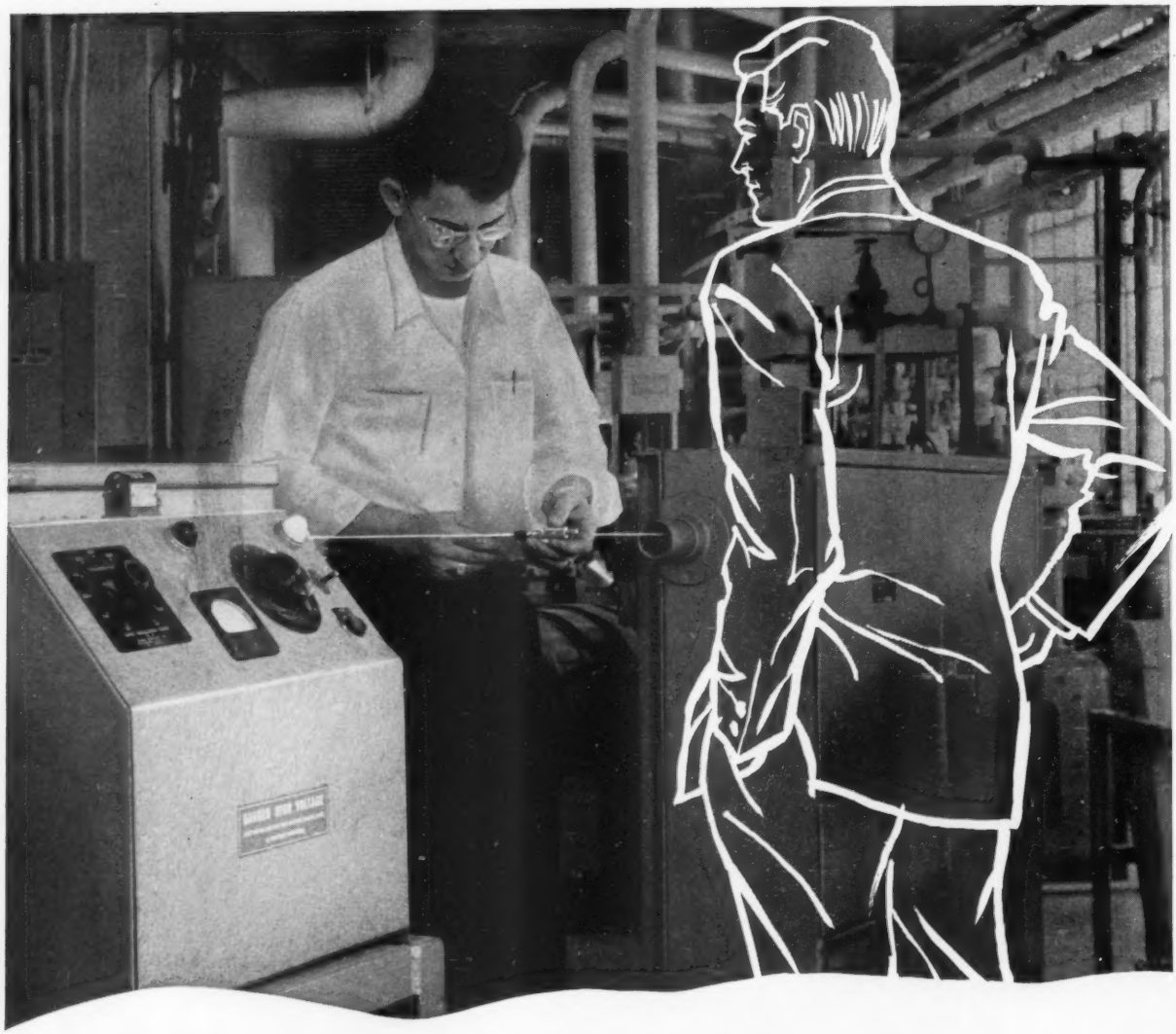

TWO NEW SOLUTIONS FOR "HOT" WIRE PROBLEMS
...FROM YOUR SILICONES MAN

Two new low shrink silicone rubber insulating compounds... developed by the UNION CARBIDE Silicones Man... are now solving many of today's electrical wire and cable insulation problems. Offering good dielectric and physical properties with easy processing, they are ideal materials for air frame applications, motor truck wires, motor leads and hook-ups, small appliance wiring, and marine wiring.

UNION CARBIDE K-1347 Silicone Compound is a premium quality stock that meets tight military and industrial specifications. It has high green strength, remilling is easy, and it is readily colored for coding. Easily extruded, it provides a smooth, non-porous, high gloss surface, and can be braided without postcure. Physical properties are excellent using either steam or hot air cures.

For economy operations where good, but not premium, physical properties are needed, lower cost UNION CARBIDE K-1357 may well fill all requirements. Available precatalyzed in both slabs and coiled strips, it can be fed directly from carton to extruder on most equipment.

Both silicones have outstanding retention of tensile strength and elongation after prolonged exposure to high temperature. Both have dielectric strength of 1000 volts/mil. Both can be cured with either steam or hot air. And both are low shrink compounds. K-1347... for premium properties. K-1357... for economy.

For more information, write or call your UNION CARBIDE Silicones Man, or Dept. DZ-9905, Silicones Division, Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. *(In Canada:* Bakelite Company, Division of Union Carbide Canada Limited, Toronto 7, Ontario.)

Unlocking the secrets of silicones

Rubber, Monomers, Resins, Oils and Emulsions

UNION CARBIDE SILICONES

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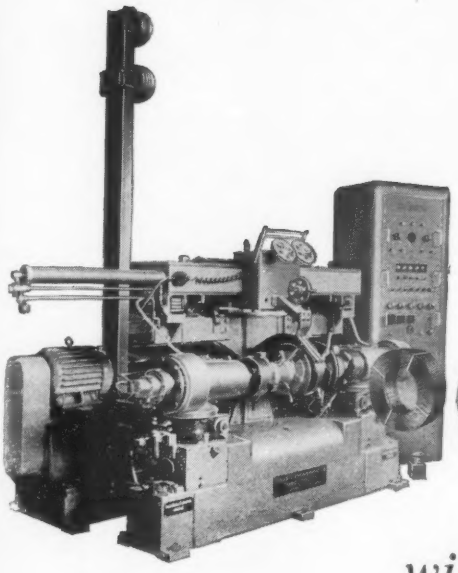
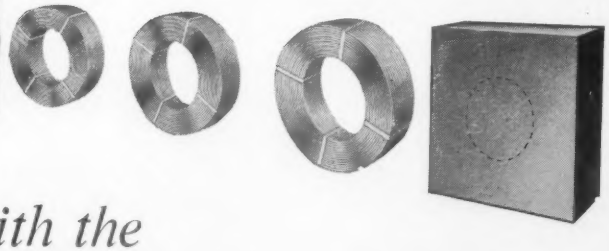


CONTINUOUS COILING AND PACKAGING

direct from your process line



with the

TA15 CONTINUOUS COILER (Available in U.S.A.)

- A compact combination of the latest techniques in mechanical, pneumatic and electronic engineering.
- Completely self contained. Will follow process line automatically without interlock connections.
- Four completed coils per minute.
- Complete and automatic checking, with automatic handling into individual boxes and automatic faulty coil rejection.
- Accurate length control, quickly changed for varying coil sizes and sections.
- Powered cutting.
- Tight, well layered coils.
- Automatic spray and oil bath lubrication.
- Automatic interlocks to keep down-time to a minimum.
- Machine tool construction.

This continuous coiling version of the 'TA.15' has been subjected to, and perfected under, continuous production conditions for two years, with the co-operation of one of our customers, Les Cables de Lyon, France.

'TA.15's' are now operating, and are being installed in North America and most of the major countries of Europe.

North and South America,
Manufacturing Associates, Michigan Oven Co., Detroit, U.S.A. All products.

France.
Licensed manufacturers, Les Cables de Lyon, Bezons. 'TA.15' only.

All inquiries are welcomed and our engineers are available to assist you in planning your automatic plant.

Return the coupon below to —

GENERAL ENGINEERING CO (RADCLIFFE) LTD

Bury Road, Radcliffe, Manchester, England
Telephone: Radcliffe 2291

GENERAL
GENERAL ENGINEERING CO (RADCLIFFE) LTD

Please send me details of the TA15 Continuous Coiler.

FIRM.....

ADDRESS.....

NAME.....

W W P

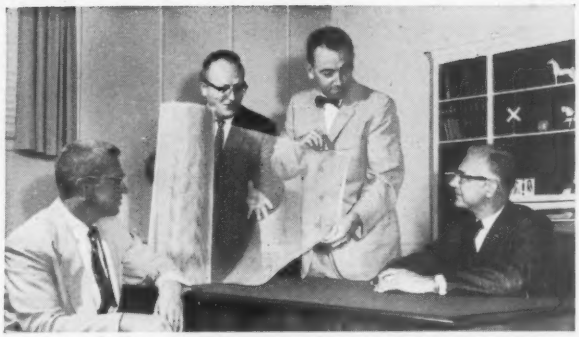
At big aluminum screening producer, Hanover Wire Cloth, Amchem Alodine has racked up a performance record far beyond the call of duty for chemical conversion coatings! The result—a line of non-glare, corrosion-resistant, color-fast aluminum screening that's making a startling impact in trade and consumer circles.

Use of Alodine at Hanover has the unqualified support and enthusiasm of management. E. B. Frock, Continental Copper & Steel Industries Vice President in charge of the Hanover Division terms Alodized aluminum "the screening of the future," that "eventually all aluminum screening will have to be treated before it is painted or finished, and Alodine is the better answer."

Hanover salesmen have proven Alodine's superiority as a sales tool in the field with a product benefits story that has been justified in actual use. Alodine-treated screening with its non-glare, corrosion-resistant, color-fast advantages has found immediate consumer acceptance for use in windows, doors, jalousies, carports, patios and swimming pools. Acceptance (and sales) of Alodized screening has been heavy nationwide, enabling Hanover to improve an already strong distribution position. Seashore use is particularly popular due to the ability of Alodine-treated screening to withstand the long-term corrosive effects of wind, salt and sun with amazing wearing qualities.

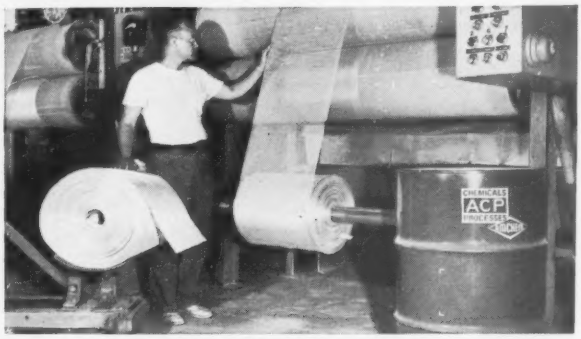
Hanover employs Alodine in an Amchem-developed and designed 5-stage system processing 903 foot rolls of Imperial screening in charcoal gray and soft green finishes at normal line speeds of 25 feet per minute in the 105-110 degree temperature range. Plans are being implemented to put Hanover on tandem roll operation. Automated chemical feed is currently being installed. Technical assistance by Amchem Representatives in setting up Alodizing operations on a production basis have resulted in bringing processing costs to a level reasonably competitive with standard or conventionally finished aluminum screening.

Strongest proof of Alodine-treated screening quality is found in the decision of one important Hanover customer to stock Alodized only and offer this one screening exclusively for the 1960 season. Hanover management, alert to consumer buying trends, looks ahead to the day when its entire output of screening will be *Alodized with Alodine* to provide in quantity this increasingly popular, uniform finished aluminum wire cloth.



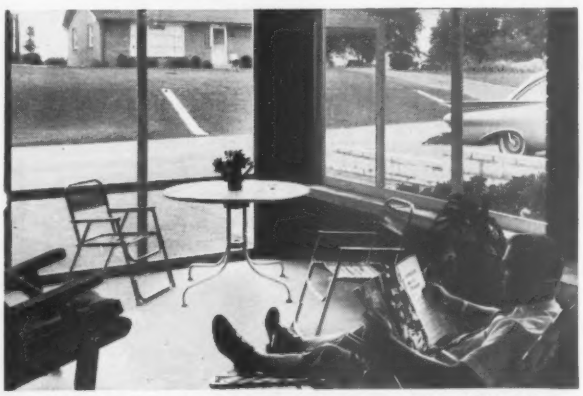
The Hanover executive team examines roll of Alodine-treated aluminum screening. Left to right: R. C. Ampspacher, Production Manager; A. Y. Wolff, General Manager; Richard Bamford, Sales Manager; and E. B. Frock, Vice President.

At beginning of the Alodine processing line, worker adjusts screening as it enters. Tandem processing is planned since wide tanks will accommodate many widths in tandem. Automatic chemical feed is being incorporated into system.



At the end of the 5-stage Alodine processing line the chemically treated wire cloth is subjected to visual spot checking as it is rewound into 903-foot rolls.

"Imperial" Alodized aluminum wire screening is packaged at Hanover Wire Cloth for shipment to customers nationwide. Each carton bears special Alodized label.

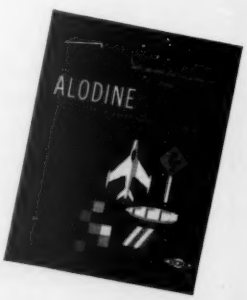


Unretouched photo shows remarkable see-thru-ability of Alodized screening used to enclose carport.

Photos and facts by Commercial Photography Division, United Press International.

The story of how Amchem Alodine helped Hanover Wire Cloth move out in front with new trade and consumer benefits appeared in the editorial pages of Modern Metals Magazine, November 1959 issue. If you'd like to learn more about how Amchem Alodine can help lend consumer appeal to your products, write for a reprint of the above article, or contact your local Amchem Representative!

Write for Bulletin 1424A describing uses of Alodine for aluminum fabrications of all types.



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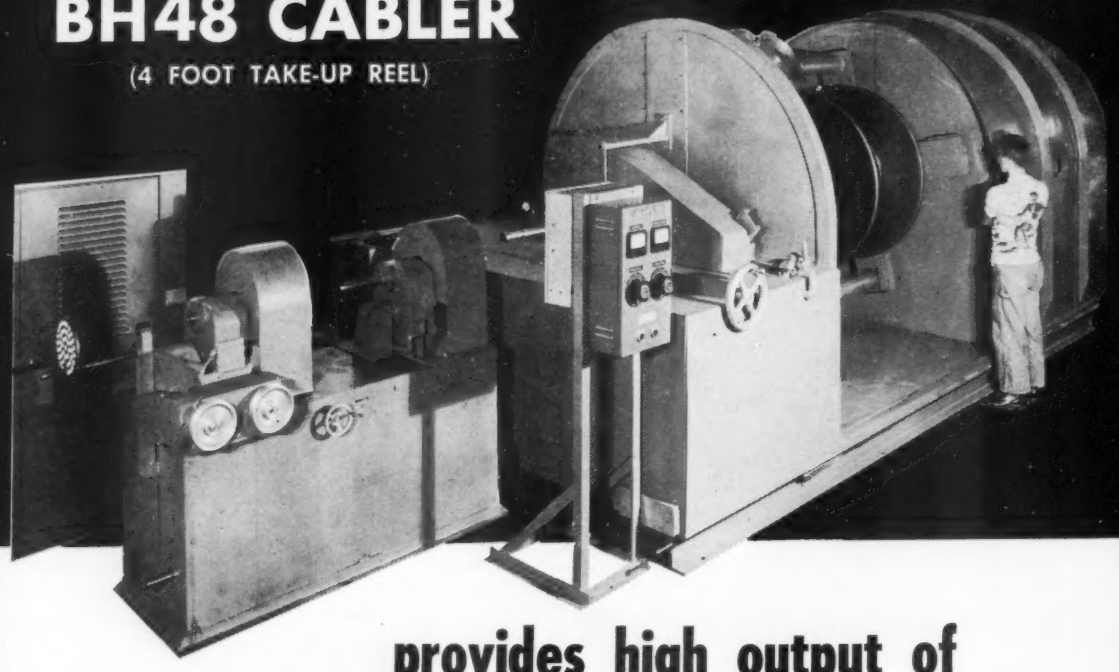

provides high output of quality cable at lowest cost

The Cook BH48 is truly a speed demon! At 6″ lay it will produce up to 12,000 feet per hour of the highest quality cable ever. That's production! And the Cook BH48 is versatile too. Two wires . . . a hundred wires . . . or more . . . the Cook BH48 will handle any number to make cable up to 1⅛″ maximum diameter. That's versatility!

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SPECIFICATIONS

PRODUCTION:	12,000 ft/hr at 6″ lay
FLYER SPEED:	400 rpm maximum
REEL SIZE:	48″F x 24″T x 22″ barrel x 8″ bore
FLOOR SPACE:	7′6″ x 16′0″
LAY RANGE:	1½″ to 18″
TWIST:	Right or left hand
FINISHED WIRE SIZE:	1⅛″
WRAPPING HEAD:	Optional
NEUTRALIZER:	Optional
Also Available in 36″ and Other Sizes	

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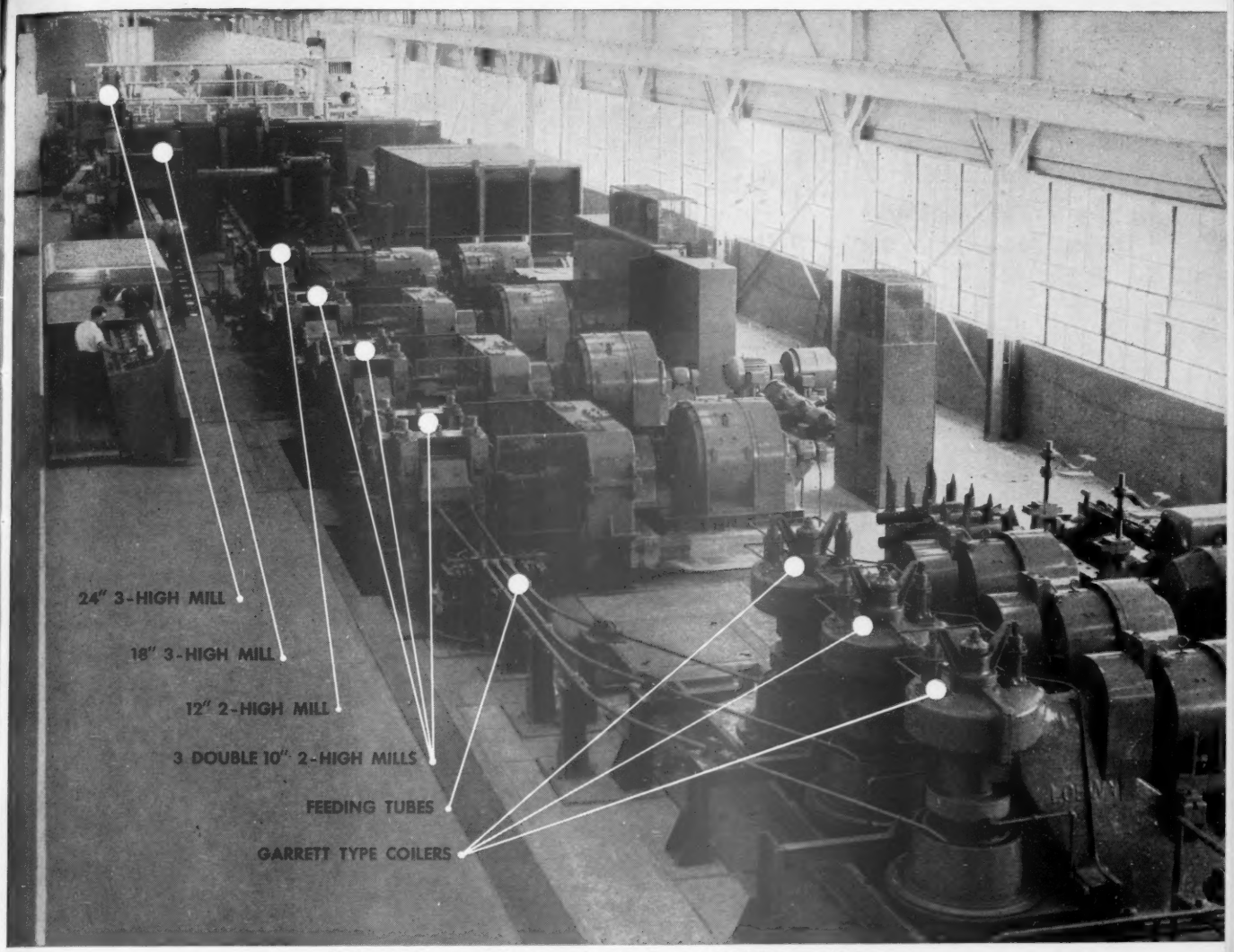

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LOEWY wire rod mills reduce wire bars to 5/16 in. wire rod automatically

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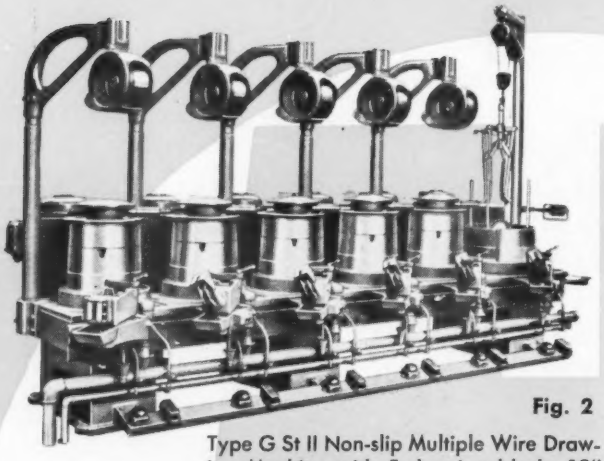

Fig. 2

Type G St II Non-slip Multiple Wire Drawing Machine with 5 drawing blocks 18" diameter and a finishing block of 24" diameter.

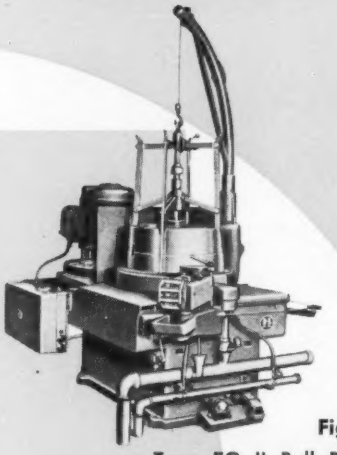

Fig. 5

Type EG II Bull Block equipped with stripper and electric hoist.

Fig. 3

Type G II Non-slip Wire Drawing Machine arranged in tandem as four double-deck machines (4 blocks = 8 drafts) for steel wire.

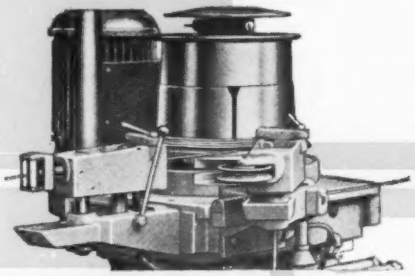

Fig. 6

Threading-up position of the Type G II d Double-deck Wire Drawing Machine. The first die holder is shown in the raised (Threading-up) position.

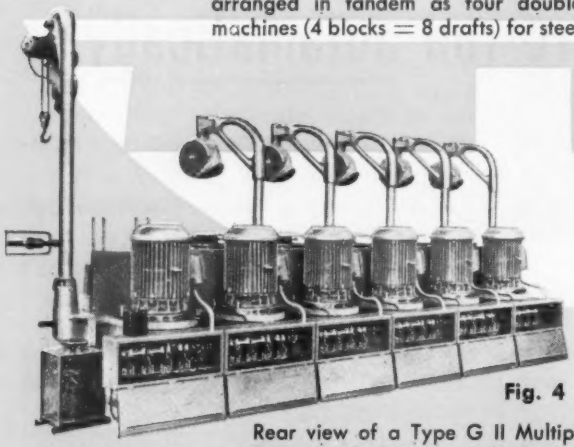

Fig. 4

Rear view of a Type G II Multiple Wire Drawing Machine for 6 drafts. Individual motor drives, equipped with built-in control gear (unit construction principle) and starting transformer for smooth starting (no starting resistors are used.)

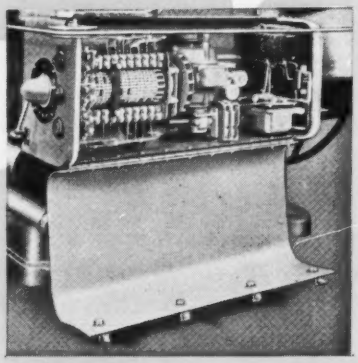

Fig. 7

Sequence switching unit for controlling the automatic starting of the individual blocks.

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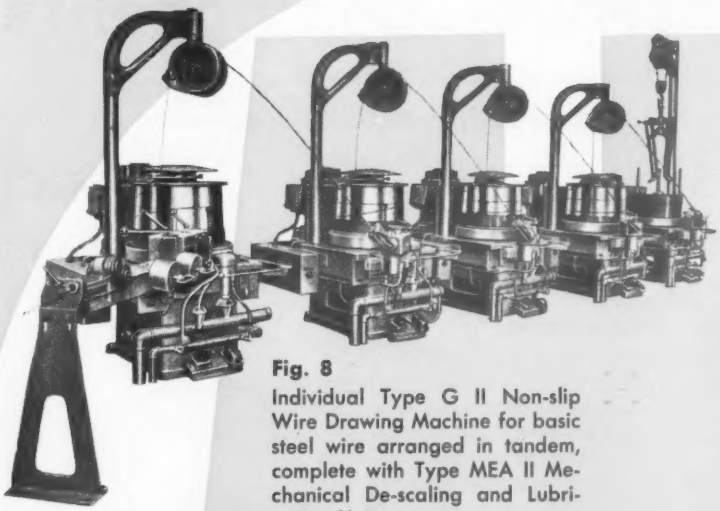

Fig. 8
Individual Type G II Non-slip Wire Drawing Machine for basic steel wire arranged in tandem, complete with Type MEA II Mechanical De-scaling and Lubricating Unit.

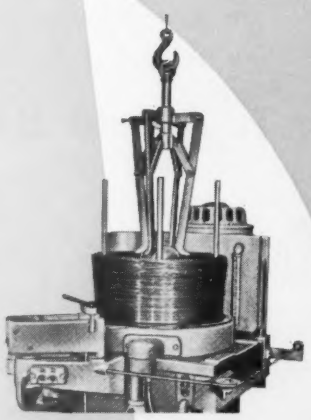

Fig. 9
Drawing block with internal collapsible stripper.

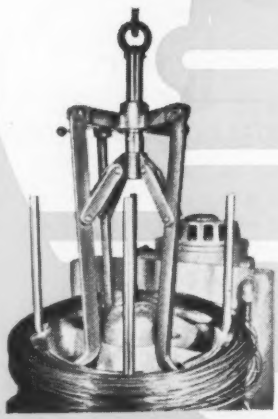

Fig. 10
The hub of the block causes the stripper to open and guides the stripper feet into slots located in the block.

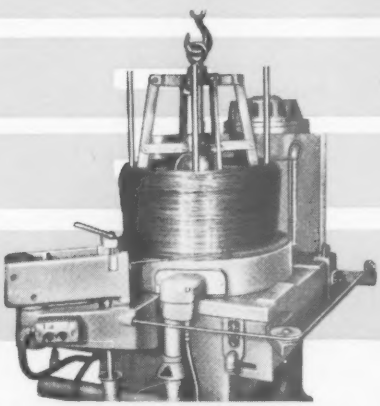

Fig. 11
The stripper is fully opened. The feet of the stripper have slid under the coil through the slots in the block.

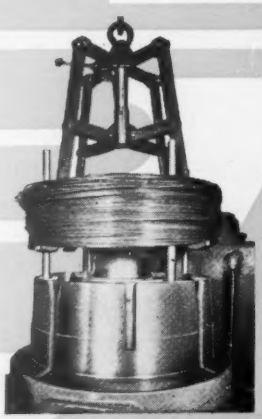

Fig. 12
The coil is lifted after the locking mechanism has engaged, thus preventing the stripper from collapsing while the coil is being lifted.

Please send us your inquiries. We will be glad to submit suggestions, proposals and quotations. Our engineers are available for consultation.

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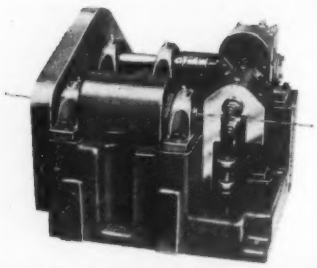

a. "LITTLE GIANT" self-feeding wire straightener. Choice of speeds to suit your requirements for tubing, recoiling, etc. up to .062" — all types of wire.

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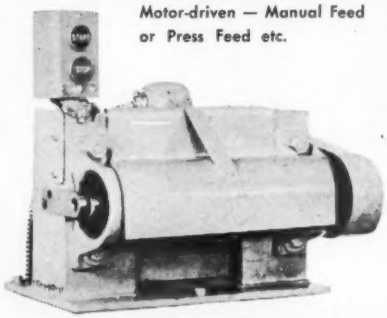
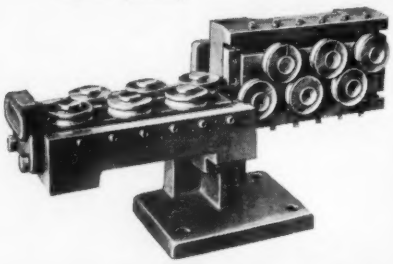
Motor-driven — Manual Feed or Press Feed etc.



Built in four sizes to handle your wire range up to 3/16". Ideal for small jobs.

c. ROLL STRAIGHTENER

12 roll central foot, removes curve of coil. Handles round, flat, or profile wire or tubing. Six models up to 9/16". Used ahead of forming, heading or pressing.



d. PEDESTAL, available for units a, b, or c. Economical, adjustable, a time saver. Can be used at several machines.

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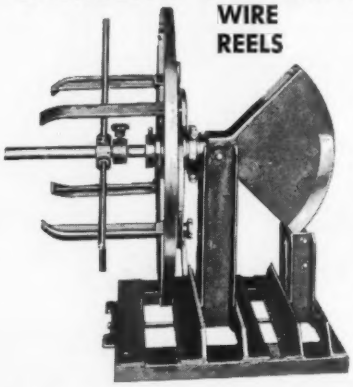

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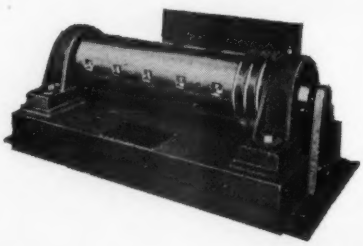

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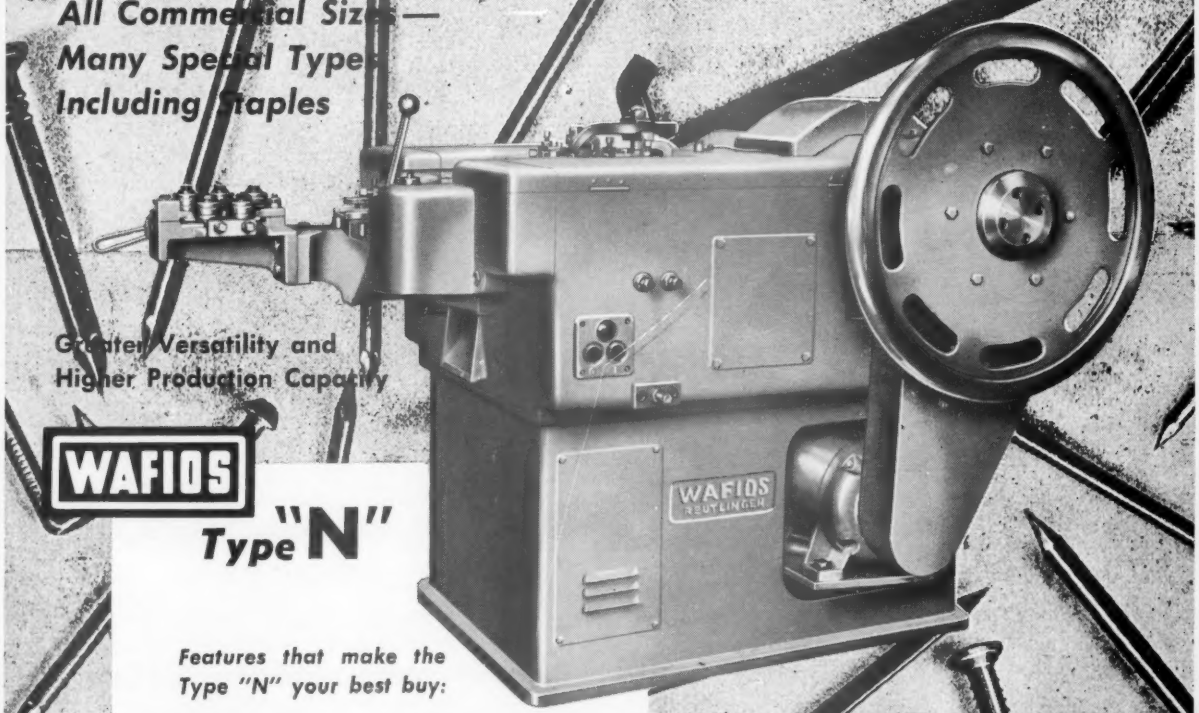

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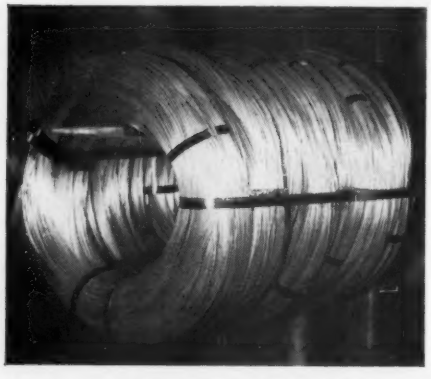

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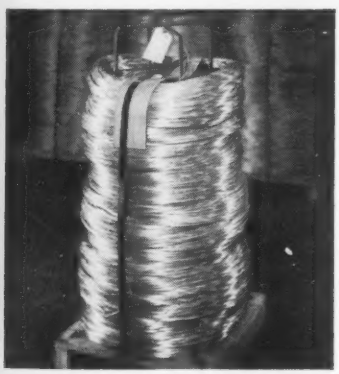

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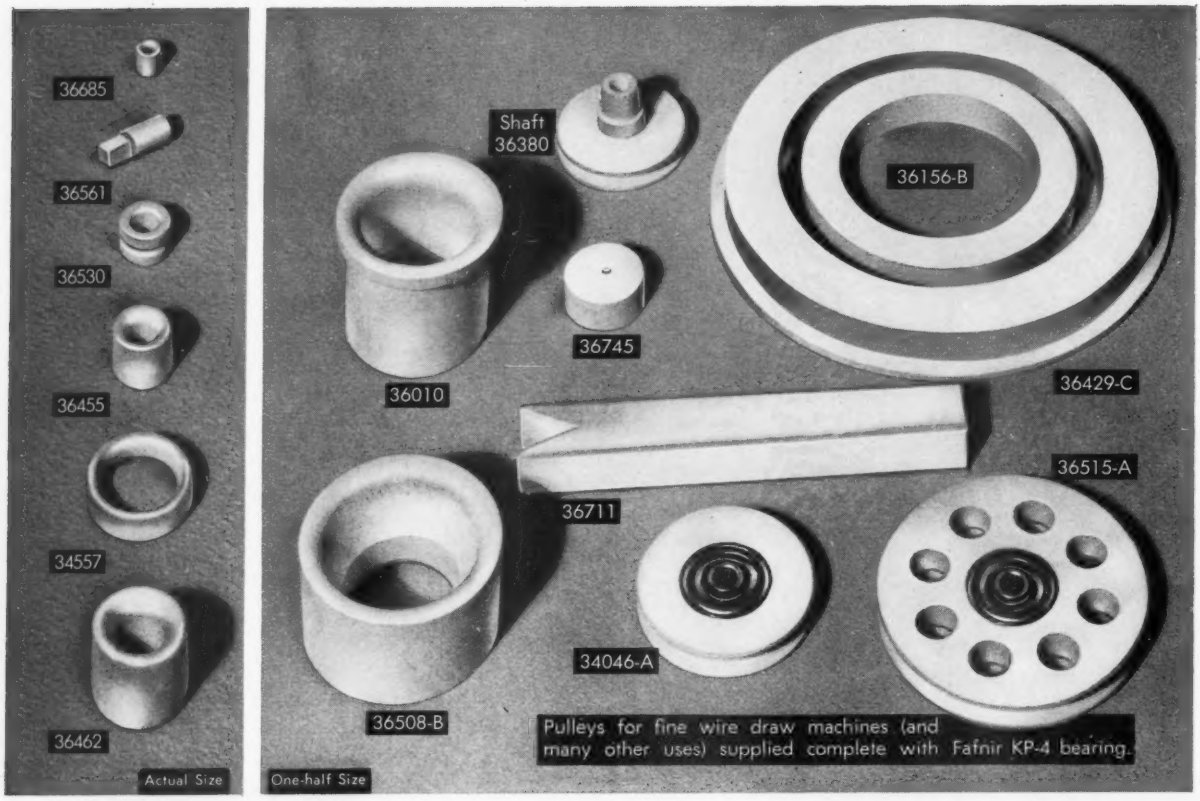

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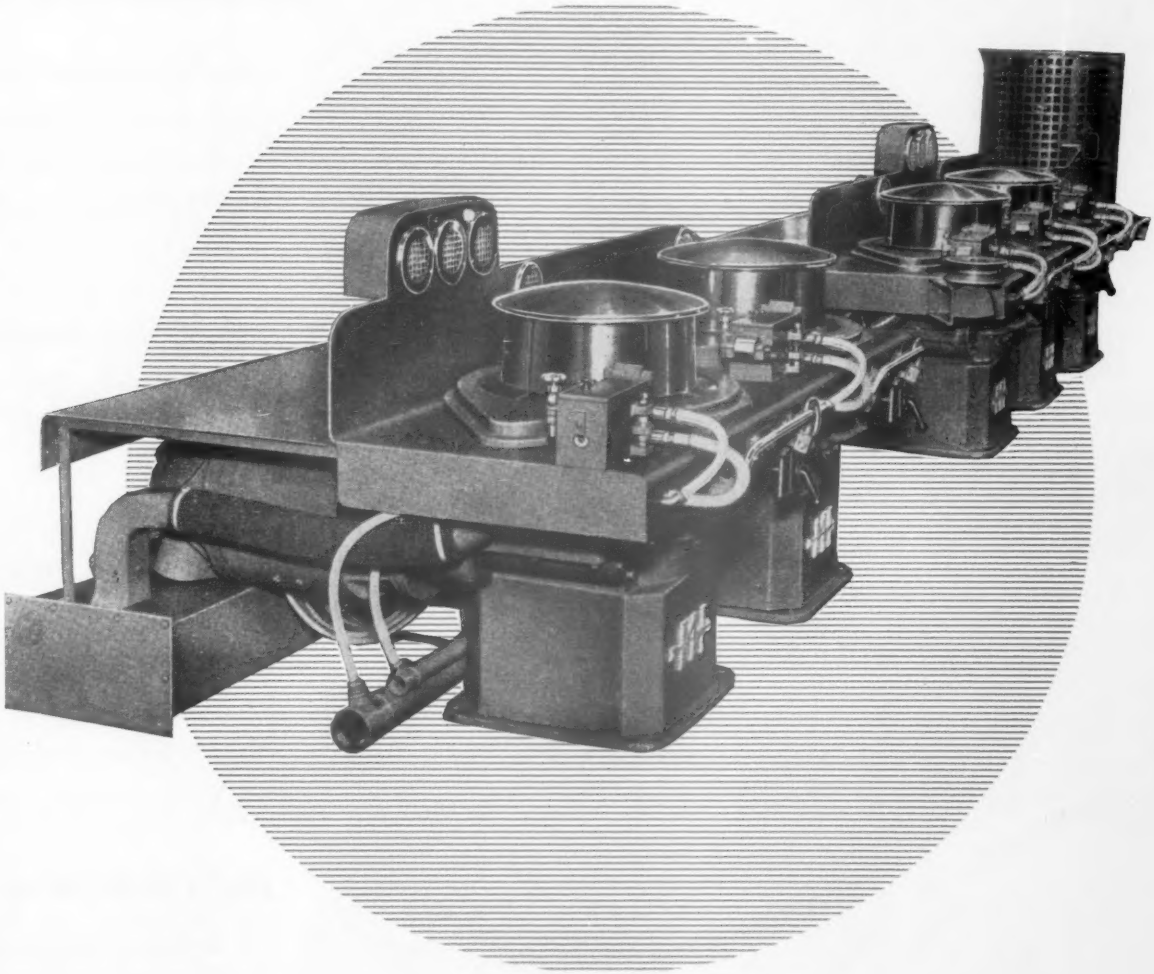

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Model 116-B will be custom engineered to your particular job.

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The Wire Outlook

While steel production has dropped a couple of points to about 93 percent of capacity and has reverted to a buyers' market, it is expected that production will hold around this level.

1960 will see the largest outlays for new steel equipment and construction in the history of steel, except for 1957. Approximately $1,600,000,000 is earmarked for expansion and modernization — $639 million more than was spent in 1959.

This is a remarkable figure, in the face of the tremendous increase in the imports of steel products from all parts of the world. Approximately 4.4 million tons, valued at $515 million, came into the United States last year, whereas our exports were at their lowest level since 1936. Imports exceeded exports by 1.5 million tons. The imported steel went principally for markets in agriculture, shipbuilding and marine equipment, aircraft, oil and gas drilling, mining, quarrying, lumbering, ordnance and other military uses.

Although auto production has been cut back to a 6.2 million rate, new orders from many smaller consumers of steel have increased and taken up some of this slack.

Despite the feeling in some quarters that the outlook is uncertain, the fact is that business is rising. The mild anxiety of the present is due possibly to business not advancing as rapidly as was hoped. Cold statistics show that in the last quarter of 1959 the gross national product was at a $484 billion rate. In the first quarter of this year the GNP rose to $500 billion. The second quarter is estimated to be around $506 billion and, for the last half, economists predict another $2 billion rise. Certainly, this degree of business activity is not bad. Some of the doubts have been occasioned by the rush to build inventories, but buyers feel that the hand-to-mouth purchasing of the previous two years has had its disadvantages and that reasonable working stocks are provident. Adequate inventories, whether of hard or soft goods, are sound business. These at present represent only about a six week supply.

Our economy may not be expanding as rapidly as those, for example, of Russia or Western Europe, and this has given rise to a feeling that we are not keeping pace with other countries. However, we are a highly developed nation now, whereas these others have a long way to go to even approximate our production and standards of living.

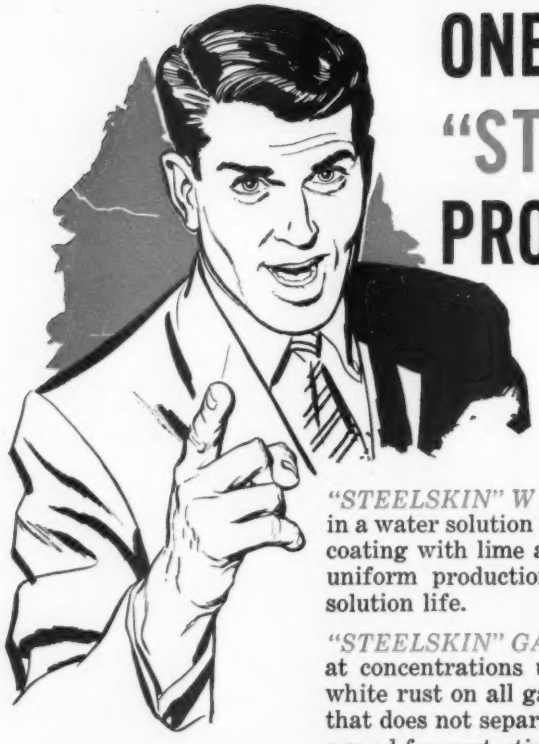
Aluminum production is on the rise, copper supply is now satisfactory, and steel, of course, has entered the easy supply stage. Lead is moving well, the tin market has been relatively poor, and zinc consumption is brisk.

The furniture and auto producers are continuing to offer a good outlet for wire sales. Fastener manufacturers are consuming large quantities of cold heading wire. Merchant wire is now moving and is available on a two to three week delivery basis. Manufacturers' wire deliveries are on approximately the same schedule. Except for the items affected by imported wire and merchant wire products, the general tone of the wire business is good.

Some of the highly optimistic forecasts for business in 1960 have undergone a revision and while the year is not expected to attain to the previously anticipated highs, it should still be a good year. The recent population count indicates that we have a little under 180 million people in the country. This continuing growth justifies both expansion projects and the expectation of a good future. The people must be served!

Edmund D. Sickels

EDITOR



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The Control of Eccentricity in Electrical Cables

by Dr. F. E. Planer
Addison Electric Company Ltd.
London, England

Dr. Planer has written two other articles for us on this subject that were published in 1949 and 1954. This article brings the matter of eccentricity up to date.

Causes of Eccentricity

Eccentricity of an extruded insulating sheath with respect to the inner conductor has been shown to be due mainly to differences in the rates of flow of the insulant around the die. These differences in flow rates in turn are caused either by an uneven temperature distribution around the die, whereby different viscosities are imparted to the issuing material, or by an uneven pressure distribution, due to the geometry of the flow paths and the effect of the pressure pattern generated by the extruder screw.

* * *

Monitoring equipment has shown that the problem of eccentricity is essentially a dynamic one; for given extrusion conditions, a position of the die can be found which will provide a concentric product. However, if the take-up speed, wire tension, or extruder screw speed are varied, eccentricity will again occur. It is not practicable therefore to effect an adjustment of the die at low extrusion speeds, or stand still.

* * *

Other factors which may affect concentricity are the angle of cable feed into, and exit from the extruder, as well as the effect of gravity on the extruded coating in certain cases.

Need for Concentricity

The need for improved accuracy in the maintenance of concentricity, as afforded by electronic monitoring equipment, is to-day generally appreciated. Very briefly, therefore, apart from the obvious requirement of preventing the outright rejection of products which are outside the specified tolerances of eccentricity, one or more of the following considerations will generally have to be taken into account.

* * *

The quality of a concentric cable of a given outer diameter is superior to that of an eccentric one, owing to its greater insulation resistance and breakdown strength, as well as due to its reduced cross talk factor and increased useful frequency range, where communication cables are concerned. On the other hand, if minimum wall thickness, rather than outside diameter is to be maintained, substantial savings in insulating material can normally be realised by improved concentricity since no extra thickness for 'probable' eccentricity need be allowed for.

Application of Eccentricity Control

Dies with fixed alignment, widely employed at one time, represent an improvement in preventing the manufacture of eccentric cable. With the increased demands on accuracy today, however, the so-called 'selfcentering die' has lost favour. The accurate monitoring and occassionally the automatic control of eccentricity are now generally accepted as the modern method of production.

* * *

A favourable factor, as revealed by the use of eccentricity monitoring equipment, is the relative stability of concentricity under constant production conditions. When an eccentricity monitor is first applied to an extrusion line, a number of extraneous causes of eccentricity usually come to light, such as uneven tensions, varying angles of feed and exit from the extruder etc. After elimination of these, it is often found that adequate concentricity can be maintained for hours without re-adjustment of the die position. Unlike the control of outer diameter which generally requires correcting action every few minutes, eccentricity therefore warrants automatic control only in special cases. In fact, it is frequently adequate to monitor a number of extrusion lines with but a

single instrument.

Principles of Measurement

There are essentially two methods of determining the wall thickness of the insulation, or the position of the conductor; the inductive, and the capacitive principle. In the inductive method one or more inductance coils in proximity to the cable surface are employed to sense the relative distances of the conductor around the cable. In the capacitive method one or more electrodes in proximity to the cable surface serve to determine the capacitances to the conductor around the cable, these being interpreted in terms of relative wall thicknesses.

* * *

The inductive method was first used by the Addison Electric Co. Ltd., pioneers in this field, in their early eccentricity gauges, as described, e.g., in Wire & Wire Products, December 1949. (1) A number of gauges today use this principle; notable among these are the instruments used by the British Insulated Callender's Cables Organisation throughout the world. (2) These gauges are illustrated in Fig. 1, and manufactured by our company for the BICC organisation and will shortly become available on the general market.

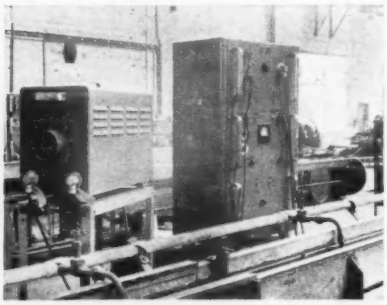

Figure 1 — Unductive Eccentricity Gauge MK III. By Courtesy of BICC and AE Co. Ltd. * * * * * * * * * *

Some six years ago an entirely new type of gauge was introduced employing the capacitive principle (3). Today this is believed to be the gauge most widely used throughout the world. The new principle offered a number of important advantages over the earlier methods. Foremost among these were the high sensitivity, stability and accuracy, with a range extending from the heaviest cables to the measurement on insulating films as thin as those on enamelled wires. Other advantages are their ease in operation and considerably lower cost. A typical instrument of this design is shown in Figure 2.

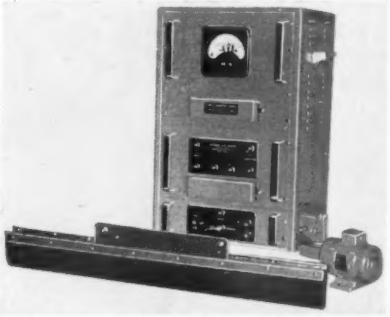

Figure 2 — Capacitive Eccentricity Monitor—Type 221. By courtesy of Addison Electric Co.

A guage based on a somewhat similar principle, has been developed by the Western Electric Co., Inc. (4) While this instrument was designed with a particular application in mind, the special patented electrode design and circuit arrangement of the former gauge make this applicable to the full range of cable production to-day, including single cores, multi-core sheathed and screened wires and cables, etc.

Features of the Capacitance Gauge

In the Capacitive Eccentricity Gauge, shown in Fig. 2, the horizontal and vertical components of eccentricity to which the die has to be aligned are resolved individually. This is achieved by the use of two similar measuring circuits. Each of these consists of a pair of electrodes, lightly spring urged against the surface of the cable, and a high frequency bridge circuit of which the two electrodes form part.

* * *

A remarkable feature is the simplicity of the gaugehead, with its two pairs of electrodes. The latter are self-aligning whatever the cable size, and the open ended structure permits the head to be placed in position, and withdrawn, while the cable is in motion, thereby rendering the equipment portable.

* * *

Another interesting feature of this gauging system is its construction on the building block principle, involving some 8 different units, which can be used in many combinations. In this feature, the eccentricity control equipment follows the general principle of a complete range of cable instrumentation, developed in parallel. The latter incorporates unitised optical and contact diameter controllers, capacitance monitors and controllers, spark testers, temperature controlled wire preheaters, corona scanning equipments, and strip chart recorder units. Some of the building blocks are conveniently common to several measuring systems. The principal units in the capacitive eccentricity series are the following:—

(1) Gaugeheads covering a measuring range from 0 to 5" o.d.

(2) Indicated Units showing the component eccentricities on meters, calibrated linearly in percent wall thickness.

(3) Cathode Ray Tube Units for the pictorial display of the cable correction.

(4) Warning Signal Units with tolerance contacts for giving an alarm signal, and for automation.

(5) Recorder Units for tracing on a paper strip the two component eccentricities.

(6) Push Button Selector Switch Units for selecting any one of four different gaugeheads for measurement and display on a single main instrument.

(7) Control Unit and servomotor for the Automatic Maintenance of centre.

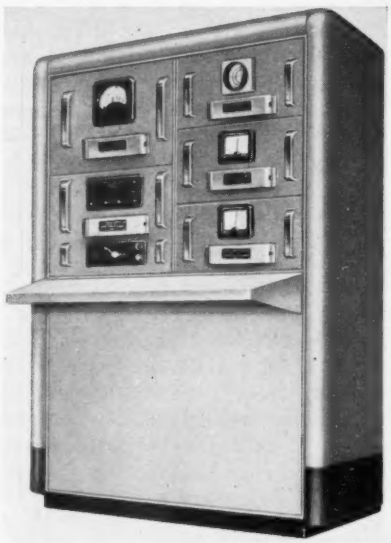

Figure 3 — Small Extrusion Control Station combining Eccentricity Monitoring (right) with Optical Size Control Equipment (left). By courtesy of Pirelli Ltd. * * * * *

The coordination of the eccentricity equipment with the general

(*Please turn to page* 508)

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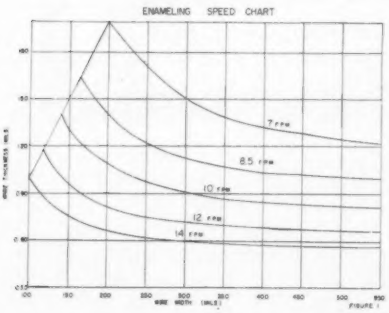
Practical Establishment of Rectangular Wire Enameling Speeds

by Richard E. Zauner
Medium Transformer Department
General Electric Company
Rome, Georgia

This article establishes speed curves designed to eliminate time-consuming calculations.

Introduction

Establishing speed curves for enameling rectangular wire has historically been a tedious, time consuming job. The many variables and wire size combinations associated with rectangular wire enameling have discouraged any systematic approach to the problem. Therefore, empirical curves have been constructed over long periods of time by keeping records of past performance and graphing the results for future reference. Such curves are often plotted as constant speed curves on linear paper with wire width as abscissa and wire thickness as ordinate. Figure I illustrates such a family of speed curves for a particular



enameling machine. It applies only under specific conditions of temperature, heat distribution, conductor and enamel composition.

* * *

Charts such as Figure 1 are excellent for their individually specified conditions, but they have two inherent major drawbacks. First, many wire runs over long time periods are required to accumulate sufficient data. Second, once established, the curves are completely inflexible. Any changes in enamel, conductor, or oven conditions render the charts obsolete and necessitate recomputing and redrawing all the curves. Except through experience and intuition there is no way to modify the curves when the process is modified.

* * *

One of the first systematic approaches to establishment of rectangular wire enameling speeds was made by **A. C. Dastoli** (1). He recognized that enameling speed was proportional to the sum of the reciprocals of wire width and thickness. He stated that:

$$S \alpha \frac{1}{W} + \frac{1}{T} \quad \text{..... 1*}$$

or

$$S = K \left(\frac{1}{W} + \frac{1}{T} \right) \quad \text{..... 1a}$$

* * *

In later work **C. V. Burns** and **H. C. Swartfiguer** (2) found that attainable wire speed could be expressed by an empirical equation similar to Dastoli's Equation 1a

$$S = \frac{K_w}{W} + \frac{K_t}{T} \quad \text{..... 2}$$

* * *

They further established that:

$$K_w = aW + b \quad \text{..... 3a}$$
$$K_t = aT + b \quad \text{..... 3b}$$

* * *

Therefore, by substitution of Equation 3a and 3b, Equation 2 resulted in:

$$S = 2a + b \left(\frac{1}{W} + \frac{1}{T} \right) \quad \text{..... 4}$$

* * *

Running two specific wires allowed evaluation of constants a and b.

* * *

This equation then permitted Burns and Swartfiguer to construct a nomograph to yield wire speeds over all wire size combinations.

* Table of Nomenclature is given at the close of this article.

Theoretical Considerations

As previously noted, charts like Figure I are applicable only where a wealth of previous data is available. However, it is desirable to set up new equipment or new enamels with a minimum expenditure of time, labor and materials to set speeds. Therefore, a new approach was necessary in order to minimize this required data. The writer's work with Burns' and Swartfiguer's Equation 4 showed that it did not exactly check with the existing curves in use. Therefore, the entire problem was analyzed in an attempt to determine the basic relationships governing enameling speed.

* * *

Figure 2 illustrates a section of a wire strand passing through an oven during a specific time interval, $\triangle\Theta$.

* * *

Heat transfer by conduction is governed by relations expressed in the Fourier and Heat Capacity Equations. The Fourier Equation for unidirectional rate of heat flow at a point is: (3)

$$\frac{dQ}{d\theta} = - kA \frac{dt}{dL} \quad \text{..... 5}$$

or, over a temperature range $\triangle t$ it may be expressed as:

$$\frac{\triangle Q}{\triangle \Theta} = - kA \frac{\triangle t}{\triangle L} \quad \text{..... 5a}$$

* * *

The Heat Capacity Equation states that over a temperature range:

$$Q = Wc_p \triangle t = V \rho c_p \triangle t \quad \text{..... 6}$$

* * *

Our problem is complicated by two facts:

1. Heat is flowing to four surfaces which are themselves moving;
2. Heat is flowing through an enamel film and then to the conductor.

* * *

The first item necessitates the use of complex differential calculus to correctly describe the phenomena taking place. (4) The second renders a rigorous solution to the problem virtually impossible because of the compounded difficulty introduced by the enamel. Therefore, a simplified approach was taken in order to obtain an overall picture of the relationships among the variables during the enameling process.

* * *

In Figure 2, let us examine what happens as the wire moves upward through height $\triangle h$ in time $\triangle \Theta$. The surfaces through which heat flows are $2W\triangle h + 2T\triangle h$ or $2\triangle h (W+T)$. The volume of wire moved is $WT\triangle h$. Therefore Equations 5a and 6 may be written as follows to approximately describe the situation:

$$\frac{\triangle Q}{\triangle \Theta} = -k (W + T) 2\triangle h \frac{\triangle t}{\triangle L} \quad \text{5b}$$

$$\frac{\triangle Q}{\triangle \Theta} = WT\triangle h \propto c_p \frac{\triangle t}{\triangle \Theta} \quad \text{6a}$$

* * *

Since the rate of change of the heat content of the wire is equal to the rate of absorption of heat by the wire:

$$k (W + T) 2\triangle h \frac{\triangle t}{\triangle L} = WT\triangle h \propto c_p \frac{\triangle t}{\triangle \Theta} \quad 7$$

$$2 \frac{k}{\rho c_p} \left(\frac{W + T}{WT} \right) \frac{\triangle t}{\triangle L} = \frac{\triangle t}{\triangle \Theta} \quad \text{7a}$$

* * *

The expression $k/\rho c_p$ is defined as thermal diffusivity (D_t). Therefore substituting in Equation 7a and simplifying then yields:

$$2D_t \left(\frac{1}{W} + \frac{1}{T} \right) \frac{\triangle t}{\triangle L} = \frac{\triangle t}{\triangle \Theta} \quad 8$$

* * *

This tells us that the rate of change of temperature with respect to time depends upon the product of thermal diffusivity, $\left(\frac{1}{W} + \frac{1}{T} \right)$, and the temperature gradient of the wire.

* * *

The speed of wire travel ($\triangle h/\triangle \Theta$), however, is determined by the rate of change in temperature ($\triangle t/\triangle \Theta$), and therefore should

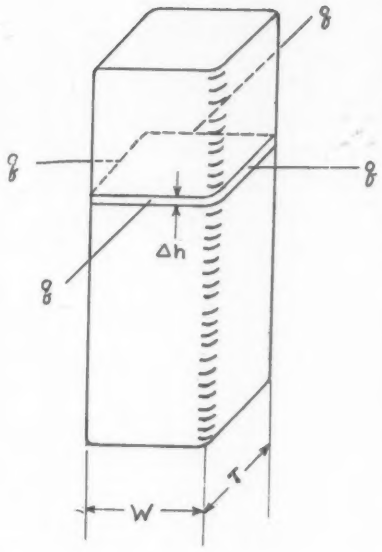


FIGURE 2

be proportional to that rate of change. This may be stated as:

$$\frac{dh}{d\Theta} \propto 2D_t \frac{\triangle t}{\triangle L} \left(\frac{1}{W} + \frac{1}{T} \right) \quad 9$$

* * *

For a specific wire of dimension W x T, its speed, $\triangle h/\triangle \Theta$, should therefore be proportional to a constant x $\left(\frac{1}{W} + \frac{1}{T} \right)$.

Empirical Application of Theory

The above discussion further verifies the observations of Dastoli that:

$$S = K \left(\frac{1}{W} + \frac{1}{T} \right) \quad 1a$$

* * *

However, it also indicates that $Kw = Kt$ in Burns' and Swartfiguer's equation:

$$S = \frac{K_w}{W} + \frac{K_t}{T} \quad 2$$

* * *

This then allows us to express Equation 1 and 2 as:

$$S = \frac{K}{T} + \frac{K}{W} \quad 10$$

or, if we let S_w = speed component due to wire width and S_t = speed component due to wire thickness

$$S_w = \frac{K}{W} \quad 10a$$

$$S_t = \frac{K}{T} \quad 10b$$

$$S = S_w + S_t = \frac{K}{T} + \frac{K}{W} \quad 10$$

Equations 10a and 10b are hyperbolic and a plot of log S_t against log T or log S_w against log W should thus yield a straight line for each. In fact, the lines should be simultaneous since $K = W S_w = TS_t$.

* * *

Thus, the only remaining problem is to isolate the S_w and S_t components of S, the total wire speed. Once this is done K may be evaluated. Then S_w and S_t for any wire size may be computed.

* * *

This isolation may be accomplished by actually running three wires of dimensions a x b, b x c, and a x c. By testing the resulting enamel in the generally accepted manner for desired properties, speeds p, q and r may be established. From these know speeds the following equations may be written:

$$S_a + S_b = p \quad \text{11a}$$

$$S_b + S_c = q \quad \text{11b}$$

$$S_a + S_c = r \quad \text{11c}$$

* * *

Solving the three equations in three unknowns gives S_a, S_b, and S_c. A log-log plot of wire dimension vs wire speed may then be made. Plotting points (a, S_a), (b, S_b) and (c, S_c) will yield a straight line which may then be extended over the size range which must be covered. Actual construction of such a chart is illustrated under "Example" below, and the chart given as Figure 3.

* * *

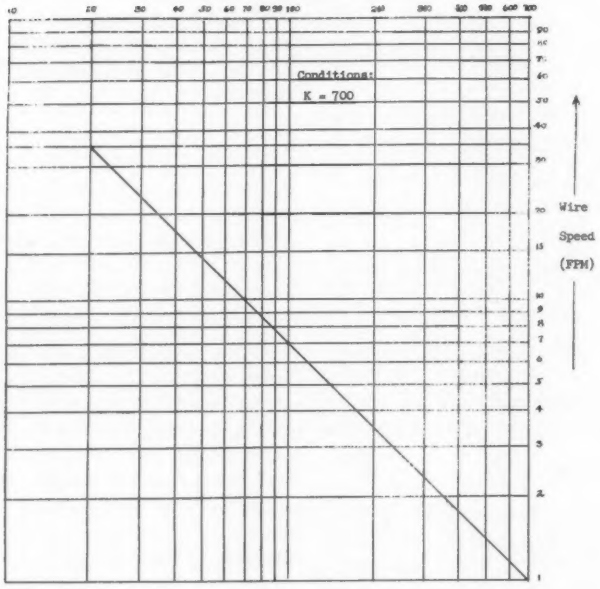
To read the running speed of any wire of dimension W x T the mechanics are:

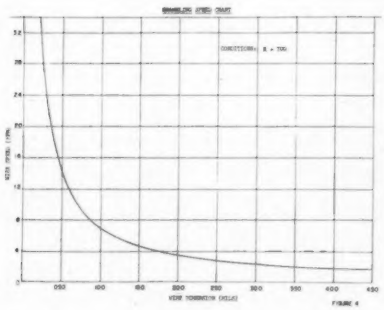
1. Enter the chart at wire width dimension, W
2. Drop vertically to the line drawn from Equation II above
3. Proceed horizontally from this point and read S_w
4. Repeat 1-3 to obtain S_t
5. Add S_w and S_t to obtain S.

* * *

If chart speeds are posted for operator reference it may be desirable to eliminate the use of logarithmic scales. This will permit easier operator interpretation of the charts. By evaluating K from Equation 10a or b and subsequently dividing K by various sizes the hyperbola of wire dimension vs wire speed may easily be drawn on

FIGURE 3 - ENAMELING SPEED CHART





linear paper. The mechanics of reading speeds are the same as for the log-log plot. Figure 4 illustrates this alternate plot obtained from Figure 3.

* * *

The reader with mathematical experience may legitimately question the need for solving three equations to evaluate K in the equation:

$$S = K\left(\frac{1}{W}+\frac{1}{T}\right) \quad \text{1a}$$

* * *

Obviously if any one wire is run, K may be evaluated because the other variables — S, W, and T will be known. Equations 10a and 10b may then be applied to determine S_w and S_t for purposes of plotting the graph of log dimensions vs log speed.

* * *

Three equations which yield three points on the curve are used for purely practical reasons. Experience has shown that standard tests such as elongation, solvent resistance, dielectric strength and film continuity distinguish between satisfactory and unsatisfactory wire. These tests, however, do not usually separate marginal wire from optimum wire. Since our purpose is to obtain a value of K that will yield optimum wire, the use of three wires is strongly favored.

* * *

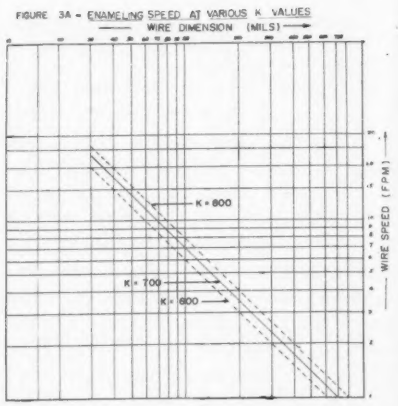
The three wire — three equation system offers these advantages over the one wire — one equation system:

1. **Three points on the log dimension vs log speed curve are obtained. If the three points do not form a straight line, the observer immediately knows an error exists. Thus, there is a "built in" check on the work that is not present when only two points are obtained from the one equation system.**
2. **No additional experimental running time is required to run the extra wires if a standard four wire enameling equipment is used. If a two wire equipment is used, the experimental runs can still be completed in one day.**
3. **If the first run with the three wire system is found to be in error, the plot made will indicate the range of wire speeds that should be investigated on the second run.**

* * *

Figure 3a illustrates the error obtained by slightly miscalculating the value of K. Dashed lines representing speed lines at K values of 600 and 800 are drawn together with the correct solid line at K = 700. It is seen that the speed error is not appreciable at large values of wire dimension, but becomes greater at smaller values of wire dimension. The following table illustrates speed differences at various K values:

FIGURE 3A - ENAMELING SPEED AT VARIOUS K VALUES



K	Wire Size (mils)	Speed (FPM)
800	100 x 070	19.4
700	100 x 070	17.0
600	100 x 070	14.6
800	400 x 100	10.0
700	400 x 100	8.8
600	400 x 100	7.5

Example

Let us choose wire sizes of 250 x 100, 100 x 070, and 250 x 070. By running these wires and testing the product, running speeds p, q, and r are established. These values in ft./min. are: p = 9.8, q = 17.0, r = 12.8.

* * *

From Equation 11:

$$S_a + S_b = 9.8$$

$$S_b + S_c = 17.0$$

$$S_c + S_a = 12.8$$

Solution:

A. $S_a + S_b = 9.8$
$S_a + S_c = 12.8$
$S_c - S_b = 3.0$

B. $S_c - S_b = 3.0$
$S_c + S_b = 17.0$
$2\,S_c = 20.0$
$S_c = 10.0$ fpm

C. $S_a + S_c = 12.8$
$S_c = 10.0$
$S_a = 2.8$ fpm

D. $S_a + S_b = 9.8$
$S_a = 2.8$
$S_b = 7.0$ fpm

Wire Symbol	Wire Dim. (mils)	Wire Speed (fpm)
a	250	2.8
b	100	7.0
c	070	10.0

$K = S_a \cdot a$
$= 2.8 \times 250$
$= 700$

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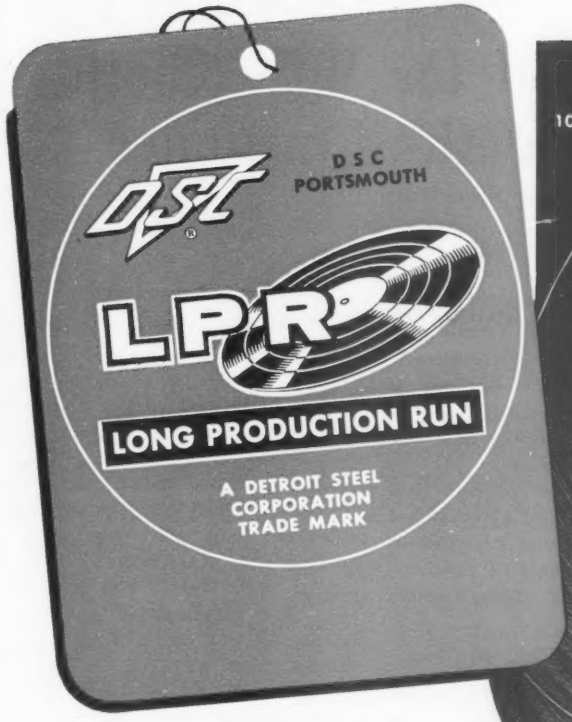

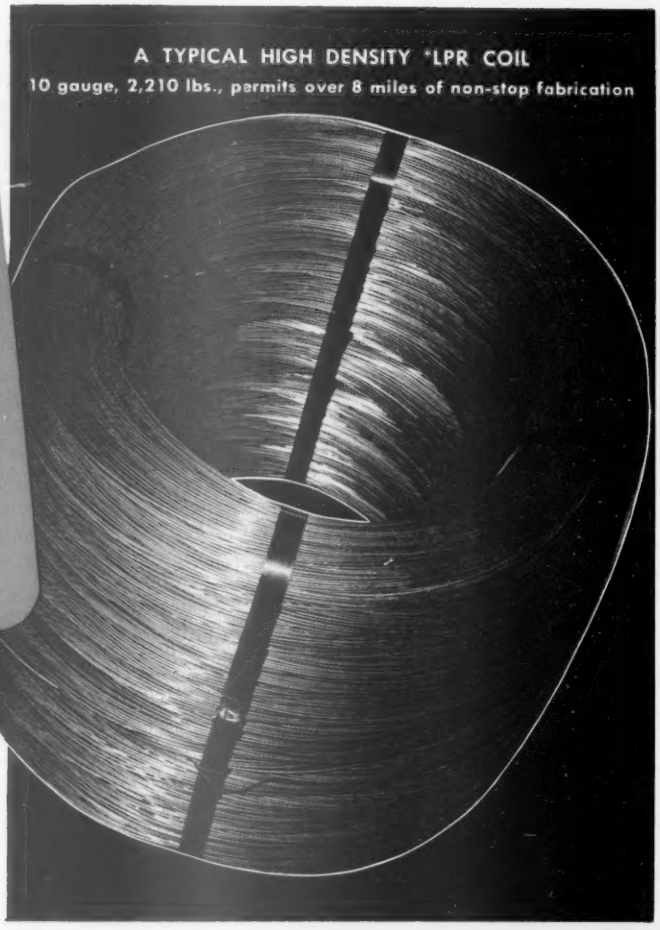

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NOTE—Savings and improvements cited were experienced following switch from traditional mill weight bundles (150 pounds to 400 pounds).

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Flat Rolled and Wire Products

Modernization Pays off for Wire Cloth Manufacturer — Benefits Consumer

by W. B. Thompson, President
Dodge Wire Corporation
Covington, Georgia

Big things have been happening in the insect screening field. It's effect on production costs is described here.

The reasons for modernizing most any industrial process usually stem from a desire to improve quality and lower manufacturing costs, as well as to improve a company's competitive and profit position within its particular field.

* * *

The recent modernization of our wire weaving facilities at Covington, Georgia, was motivated primarily by the need for expanded production to satisfy a growing market for metallic insect screening used in windows and doors.

* * *

Convinced that expansion without modernization was not progress, we undertook a thorough revamping of our production operations, including the installation of the latest type high-speed wire weaving equipment. Today, not only has this modernization program reversed the tide of rising production costs and given us higher output, but we have gained an added bonus of improved product quality. What's more, we are able to market this finer quality wire cloth at competitive, not premium prices.

* * *

In approaching our production problems initially, weaving operations without doubt presented the greatest modernization challenge and were the logical place to start.

Although some of our equipment had been in operation less than four years, all of our 90 looms were of the bobbin type . . . a design that saw its introduction some 50 years ago. We were not anxious to revamp our production operations on the basis of machinery and performance ratings quite so ancient!

* * *

Thus, we were in the market for new weaving equipment; machines that would be capable of higher production speeds, would require fewer man-hours to operate, and still would not require any greater maintenance or servicing expenditures than our existing setup.

* * *

About this same time—the latter part of 1957—The Warner & Swasey Company, Cleveland, was nearing production on an entirely new type of wire weaving machine. Based upon a loom design that the company was already building for the textile market, the new machine replaced the conventional bobbin arrangement with a "flying shuttle". It held promise of increasing wire cloth production rates as much as five or six times over former equipment.

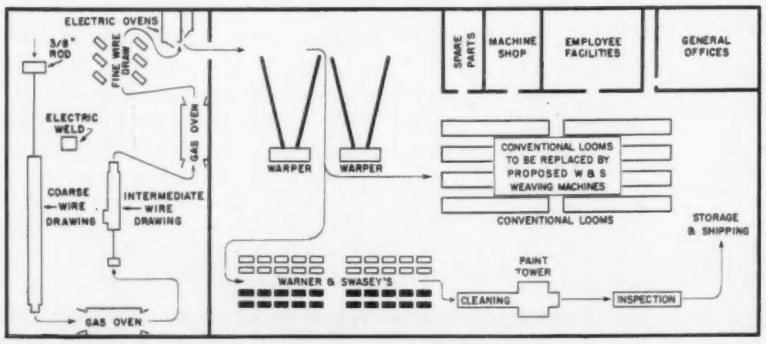


Figure 1 — Plant layout of Dodge Wire Corp. at Covington. * * * * * * * *

After careful investigation of this new equipment and an actual trial of a prototype model in our plant, an initial order was placed for 14 machines. A subsequent reorder raised this total to twenty.

* * *

Once we had our new equipment selection out of the way, we turned our attention to the Covington mill itself. The first problem that confronted us was disposing of our old bobbin type machines. Not wanting to sell these old looms to fly-by-night shops at mere give-away prices, we elected to scrap them. As our new equipment arrived, we simply dragged the relics out of the plant and left them piled in the yard to rust. They will eventually be sold as junk.

* * *

Because our re-equipment plans were predicated on a gradual replacement of our in-plant machinery rather than an instant changeover, scrapping problems actually were at a minimum. However, we did decide upon an immediate rearrangement of our existing production layout to achieve the efficient straight-line setup that appeared best suited to high-speed looms. Once this is accomplished, new machines will be added to the line with very little inconvenience or interference with production. The straight-line system, incidentally, will extend all the way from raw materials receiving to finished goods shipping.

* * *

How has our modernization program paid off?

* * *

Currently, our initial twenty Warner & Swasey-Sulzer looms produce approximately 80,000 sq. ft. of aluminum insect screening per day, requiring only four operators per shift, three shifts per day. Under our old production setup, it took 90 bobbin type looms

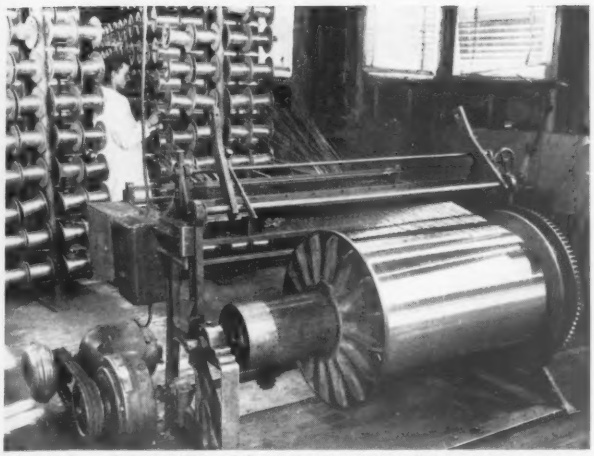


Figure 2 — Preparation of loom beams. 900 individual ends of wire are drawn through from the warp rack and wound on the beam.

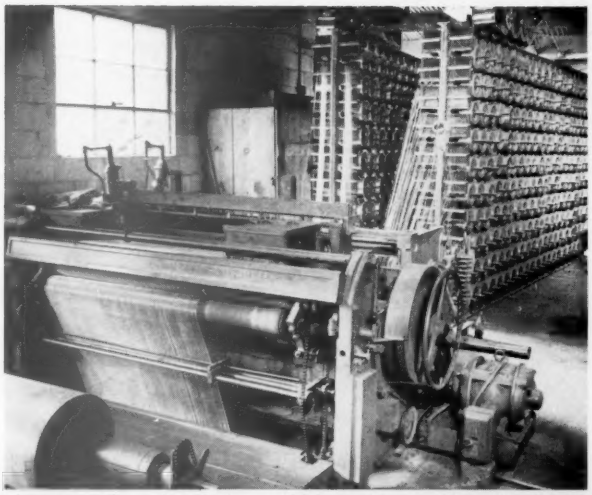


Figure 3 — One of Dodge's new high speed looms is equipped with a special creel arrangement to handle special or small quantity orders.

and 40 men to achieve this output in a single day. What's more, the new high-speed looms consume only 4,480 sq. ft. of floor space, compared to 15,984 sq. ft. for the comparable battery of old machines.

* * *

Labor costs in weaving operations have been cut 77 per cent.

* * *

Maintenance and servicing costs also are reasonable. This is due in part to the up-to-date design of our new equipment—quality materials, anti-friction bearings, better lubrication, etc.—and to the fact that the new looms operate only 480 machine-hours per day, contrasted with 2,160 machine-hours required by our old machines in achieving equal production (80,000 sq. ft.) Although the new high-speed looms are somewhat more intricate than the bobbin type design, this has not created any difficult problems from a maintenance point of view.

* * *

Coiled 3/8″ diameter aluminum rod arrives at our receiving dock by truck. This rod is first drawn to 3/16″ diameter in six passes in the initial production operation, with appropriate annealing to counteract normal work-hardening. This 3/16″ wire is then redrawn in nine passes to a diameter of .064″, again followed by annealing.

* * *

From here the wire moves immediately to a fine wire drawing operation, involving eight Vaughn ringblox machines equipped with 14 diamond dies. These machines draw the aluminum wire down to .013″ at a speed of 6,000 ft. per minute. The .013″ wire is taken up on aluminum spools, each hold-

(*Please turn to page* 513)

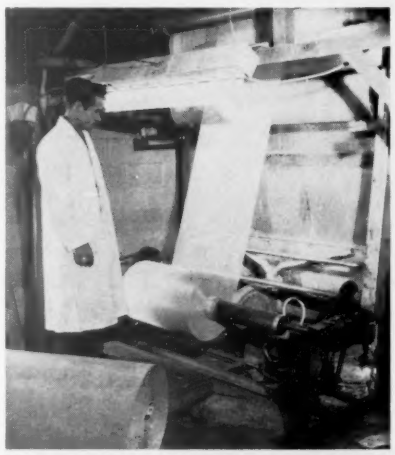
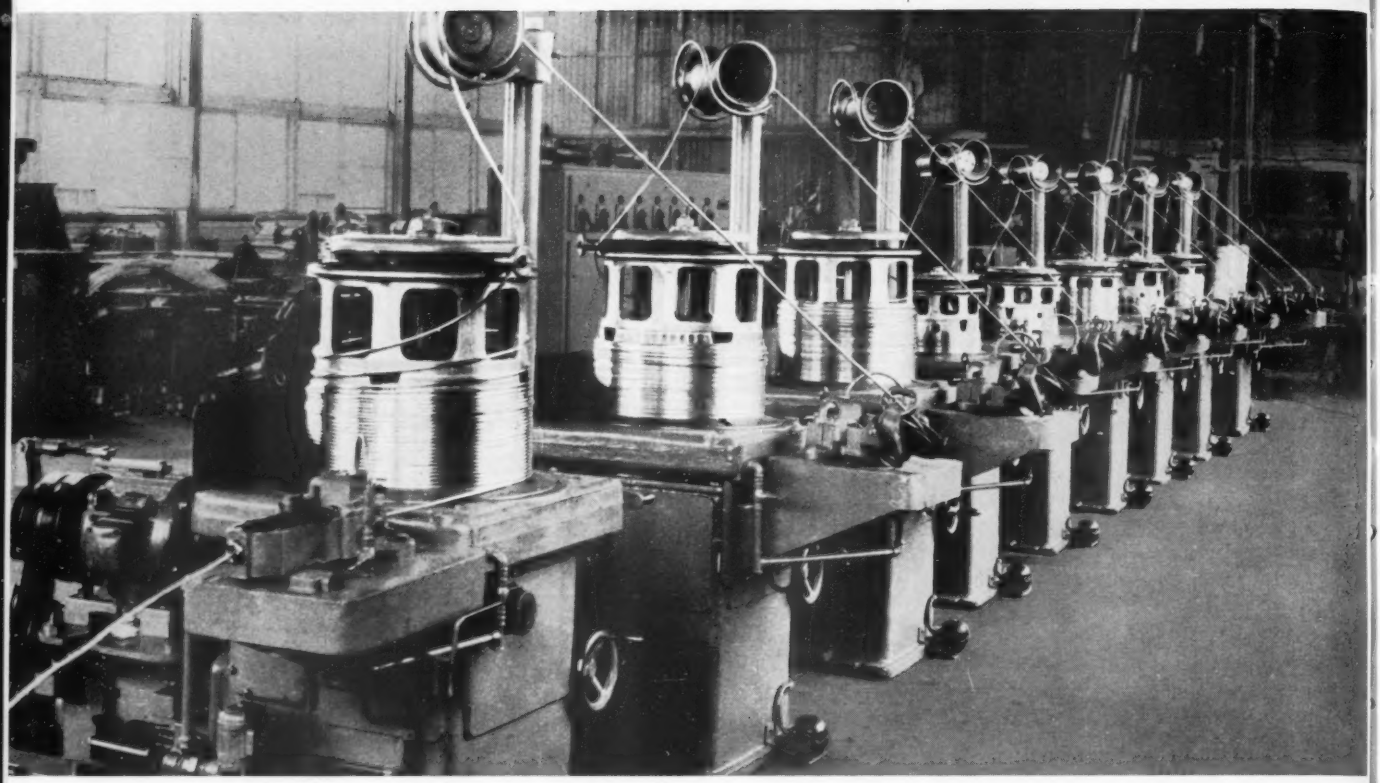


Figure 5 — 1000 ft. rolls of screening are taken from the looms to the painting tower, where it is painted and dried.

Figure 6 — Final inspection, the last step in a series of quality control measures, precedes packing and shipping.

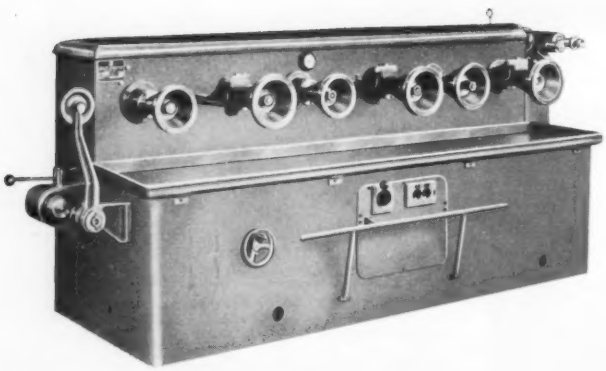
Figure 4 — Overall view of aluminum screen weaving department showing battery of 20 machines.

KRUPP



Wire Drawing Machines

System KRAUTZ



Type GZK Heavy Wire Drawing Machine of vertical block design,
maximum traction power 10 tons (22000 lbs), block diameter 800 and 600 millimeters (32 and 24 in.), machine can be supplied for straight-line drawing too.

Type MZK Medium Section Wire Drawing Machine of vertical block design,
maximum traction power 3000 to 800 kilos (6600 to 1750 lbs) corresponding to block diameter of 550, 450 and 320 millimeters (22, 18 and 12.1/2 in).
Double deck blocks on demand.

Type NZK Wet Drawing Machine, up to 25 dies, block diameter 275 or 210 millimeters (11 or 8 in.) for coil removal and with spooler up to 45 kilos (100 lbs) capacity.

Type FZK Fine Wire Drawing Machine, up to 24 dies, with spooler up to 2,5 kilos (5.1/2 lbs) capacity.

Type SZK Copper Rod Shaving Machine,
maximum entry size 15 millimeters (.590 in.),
block diameter 600 millimeters (24 in.).
All the Drawing Machines except the Heavy Wire Type can be equipped with infinitely variable speed drive.

Auxiliary Equipment
Type ASK Wire Pointer with two roller pairs
Type EVK power driven Threading-up Device
Type EAK powered Coil Removing Device
Type EMK Descaling Machine
Type SPK Wire Spooler Universal Coil Winder

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Ethylene Copolymers for Wire Coating

by

R. F. Craig — T. E. Branscum — P. J. Boeke

Plastics Sales Division

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Bartlesville, Oklahoma

This paper was presented by Mr. Craig at the Eighth Annual Symposium on Technical Progress in Communication Wires and Cables under the sponsorship of the U. S. Army Signal Research and Development Laboratory, December 2, 1959, at Asbury Park, N. J.

Introduction

The wire and cable industry, aways on the alert for new coating resins, was quick to recognize in the linear polyethylenes a material offering potentially very desirable properties. The high abrasion resistance, chemical inertness, excellent electrical properties and elevated service temperatures created great interest in the early commercial offerings of linear polyethylenes. However, the use of these early resins in wire and cable applications did not materialize as expected. This was due mainly to a lack of stress cracking resistance. Stress cracking problems were not new to wire and cable people. The problem of environmental stress cracking was first encountered in conventional polyethylene sheathing used in communication cable. Outstanding work done at the Bell Telephone Laboratories (1) and other laboratories helped elucidate the problem and determine some of the causative factors. Due largely to work of this type, resin manufacturers eventually were able to develop grades of conventional polyethylene which were highly resistant to environmental stress cracking.

* * *

More than four years ago Phillips recognized the problem of stress cracking in linear polyethylene resins. A variation of stress cracking commonly called thermal stress cracking or thermal embrittlement (2) appeared to be the dominant problem. In a paper given four years ago at the Wire and Cable Symposium (3), copolymerization was reported to be one of the most effective means of improving resistance to stress cracking. This was based on exploratory work involving the copolymerization of ethylene with a number of 1-olefins which resulted in a series of copolymer resins all having a marked improvement in resistance to both environmental and thermal stress cracking. At that time Phillips started a research program to develop a tailor-made resin for the wire and cable industry which would have excellent stress crack resistance yet retain good processibility and the desirable properties of linear polyethylene. This work culminated in the development of wire and cable grade ethylene copolymer (5000 Series) resin. This paper reviews the pertinent physical and electrical properties of the copolymer resin, discusses extrusion equipment and conditions and presents field installation tests of various copolymer coated wire and cable.

Properties

The wire and cable grade copolymer resin, designated as the 5000 Series, has a nominal density of 0.950. This compares with 0.960 for the original Marlex* polyethylene resins. The lower density is a result of the copolymerization of ethylene with 1-butene. The copolymerization with 1-butene affects the properties to varying degrees. Table 1 shows some of the general properties of copolymer resins compared with the 0.96 density homopolymer resin. There is a slight reduction in tensile strength and softening temperature but a marked increase in flexibility. The desirable low temperature properties of the homopolymer resin are retained. Probably the most significant difference between the copolymer and homopolymer resin is a six-fold increase in resistance to environmental stress cracking. This difference is even more striking in a comparison of thermal stress crack resistance. Table II shows the comparison between the resistance to thermal stress cracking of the copolymer and homopolymer resins in a test involving specimens held under a constant strain between 5 and 40 per cent at 160°F. In this test, 1/8" compression molded strips are bent around mandrels of varying radii to impose predetermined strain on the outer surface and noting the time when cracking takes place. Results of another test are shown in Table III in which 1/8" compression molded specimens were bent in a channel which imposes a constant strain of 37%. Specimens were then subjected to various temperatures from 180° to 250°F. Again the low melt index copolymer resin showed no failures while the homopolymer resin fails at all such temperatures in less than 24 hours.

* * *

A third test commonly used in the wire and cable industry is the twisted wire test. In this test, high strains are imposed by twisting the coated wire around its own diameter. In several versions of the test the twisted wire is either exposed to elevated temperatures in a forced draft oven or elevated temperatures in a stress cracking environment. Table IV illustrates the excellent thermal stress crack resistance of both natural and black compounded copolymer resin in the twisted wire test.

* A trademark for Phillips' family of olefin polymers.

TABLE I

COMPARISON OF TYPICAL PROPERTIES OF COPOLYMER AND HOMOPOLYMER RESIN

	ASTM Test	Copolymer Series 5000	Homopolymer Series 6000
Density	D-1505-57T	0.950	0.960
Tensile Strength 20"/min., psi	D-412-51T	3800	4400
Stress At Yield 20"/min., psi	D-412-51T	3800	4400
Modulus of Elasticity psi	D-638-56T	110,000	150,000
Stiffness in Flexure	D-747-50	115,000	150,000
Hardness, Shore D	----	67	68
Vicat Softening Temp., °F	D-1525-58T	255	260
Brittleness Temp., °F	D-746-57T	<-180	<-180
Environmental Stress Cracking (Bell Test) F_{50}, hours	----	300-400	60
Water Absorption, 30 Days, 80°F, %	----	<0.01	<0.01
Abrasion Resistance CM² loss/100 cycles Armstrong, 10# load	----	0.24	0.27
Taber Index Wt. loss, mg./1000 cycles CS-10 Calabrase Wheel	----	2.35	2.0

TABLE II

Thermal Stress Cracking Test at 160°F

Failure Time in Hours vs. % Strain

% Strain	Hours to Failure 0.3 M.I. Copolymer Resin*	0.2 M.I. 0.96 Density Homopolymer
40	>1000	<1
30	>1000	<1
20	>1000	<1
10	>1000	7
5	>1000	>1000

*Stabilized with 0.1% Santonox

TABLE III

Thermal Stress Cracking Test on 0.3 M.I. Copolymer at Various Temperatures 1/8" Molded Specimens Strained at 37% in Bell Laboratory Channel

Temperature	Hours to Failure Natural Copolymer*	Black Compound (TR-201)**
180 F	>1000	>1000
212 F	>1000	>1000
250 F	>1000	>1000

* Stabilized with 0.1% Santonox
** Contains 2½% Carbon Black and 0.1% Santonox

TABLE IV

TWISTED WIRE TEST

STRESS CRACK RESISTANCE OF 0.3 M. I. COPOLYMER RESIN

	Hours To Failure Natural*	Black Compound (TR-201)**
212°F Air Oven Test Coated #14 Copper Wire	>2500	>2500
250°F Air Oven Test Coated #14 Copper Wire	>2500	>2500
195°F 50% Igepal Test Coated #22 Copper Wire	>1000	>1000
180°F Distilled Water Test Coated #14 Copper Wire Specimens Aged for 14 Days at 100°C prior to test	>1000	>1000

* Stabilized with 0.1% Santonox
** Contains 2½% Carbon Black and 0.1% Santonox

TABLE V

ELECTRICAL CHARACTERISTICS AND OTHER PROPERTIES FOR WIRE AND CABLE USES

	Natural	Black Compound (TR-201)*
Dielectric Constant		
1 Kilocycle	2.35	2.64
1 Megacycle	2.35	2.62
Dissipation Factor		
1 Kilocycle	<0.0002	0.002
1 Megacycle	0.0003	0.004
Dielectric Strength 1/8 inch Thickness - Volts/mil	500	475
Volume Resistivity	$>6 \times 10^{15}$	-

*Contains 2½% channel black and 0.1% Santonox.

Predominant requirements for any acceptable wire and cable resin are excellent electrical properties. Those properties so characteristic of the conventional polyethylenes are also possessed by the copolymer resin. For uses in high frequency communication cable and for power cable the **copolymer** resin has very low dielectric constant and dissipation factor coupled with a high dielectric strength. These are shown in Table V. Because of an extremely low sensitivity to water and moisture, these properties are virtually unchanged even after prolonged exposure of the copolymer resin to water or very moist service conditions. The ability of the copolymer resin to resist voltage break-down is illustrated in Figure 1 which shows dielectric strength and break-down voltage as a function of wall thickness.

* * *

In multiconductor communication and power cable it is necessary to color code individual conductors for identification purposes. Where pigments are thus used to give a solid colored coating, the pigments used cannot adversely affect the dielectric properties of the resin. The copolymer resin is stable to a wide range of commercially available inorganic pigments, showing negligible change in dielectric constant, dissipation factor and dielectric strength even with loadings up to one per cent. Table VI shows the effect of one per cent loadings of various pigments on these dielectric properties.

* * *

The stability of a resin to high temperature aging is of interest

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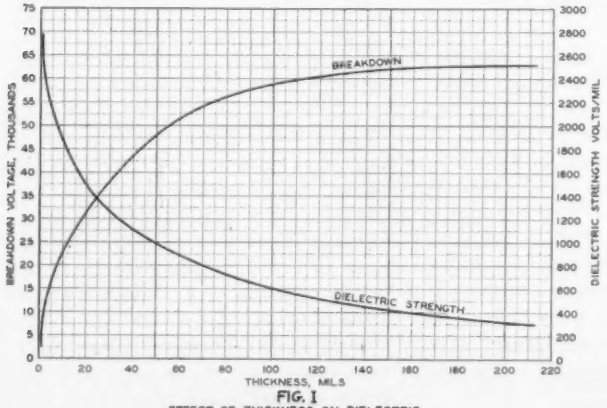

FIG. 1
EFFECT OF THICKNESS ON DIELECTRIC STRENGTH AND BREAKDOWN VOLTAGE

TABLE VI

Effect of Pigment Loading on the Electrical Properties of Linear Polyethylene

	1 Kc K	1 Kc D	1 Mc K	1 Mc D	Dielectric Strength Volts/mil
1% Titanium Dioxide (Rutile)	2.35	<0.0002	2.35	0.0003	500
1% Mercadmium Red	2.35	<0.0002	2.35	0.0003	495
1% Cad.-Lithopone Yellow	2.36	<0.0002	2.35	0.0003	510
1% Cad.-Selenide Orange	2.35	<0.0002	2.36	0.0003	515
1% Phthalocyanine Blue	2.36	<0.0002	2.35	0.0003	500
1% Iron Oxide	2.35	<0.0002	2.35	0.0003	495
1% Phthalocyanine Green	2.35	<0.0002	2.35	0.0003	495
1% Channel Black	2.35	<0.0002	2.36	0.0003	500
2.5% Channel Black	2.64	0.002	2.62	0.004	475
Control	2.35	<0.0002	2.35	0.0003	500

Mechanized Setups Make Precise Rod Bends at High Rates

by Kenneth E. McClain
Tool Engineer
Rochester Products Division
General Motors Corporation
Rochester, New York

Components for automotive carburetors are fed from hoppers and magazines to bending position and drop or are blown from machines to complete the series of rapid automatic cycles.

As the Rochester Products Division, of General Motors, is among the important manufacturers of carburetors, produced in many models and large volume, its plant includes equipment for making nearly all components on a high production scale. Among small parts needed are rods made mostly from 5/32— and 7/32-in. round bar stock that are cut to length often after one or more grooves are turned, in screw machine operations.

* * *

Most of these lengths subsequently are given one or two right angle bends, using different types of equipment, chiefly light mechanical presses. When the bend requires a sharp square inside corner, bending commonly is done in an ordinary hand loaded die if there is no objection to the metal being made thinner at the bend. If it is necessary to avoid significant thinning out by the ironing action along the outer radius, where the metal drags over the die surface, use is made of dies having rockers that move through a true radius in swinging about a pivot pin to make the bend.

* * *

In either of these types of dies, it is necessary to locate the rod endwise to insure bends at correct location. Unless a hopper or magazine, a combination of the two or some other mechanism is rigged for automatic feed to the die, hand loading is required and operation is comparatively slow. Partly for this reason, means for other than conventional stamping presses are now being applied for some rod bending operations.

* * *

Of these, the fastest and most interesting is the completely mechanized Nilson wire forming machine, Figs. 1 and 2. In this machine, there are camshafts for slide operation extending across all four sides of the table. Near the center of the latter is the bolster or anvil supporting the form block around whose two forward edges pump rod blanks are bent two at a time. Fig. 3 shows such a rod before and after bending, a square inside corner being produced ¼ in. from the short end and 1-3/8 in. from the other end.

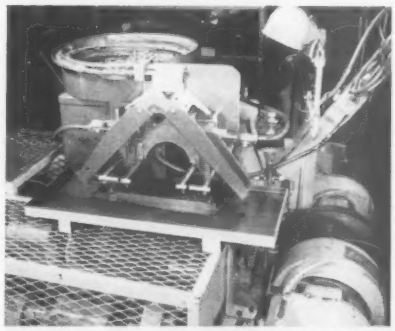

Figure 1 — Nilson wire forming machine used by Rochester Products Div. of General Motors, and equipped with hopper and magazines for feeding two short rods, precut in a screw machine, to position where both are clamped and one end of each is bent 90 deg.

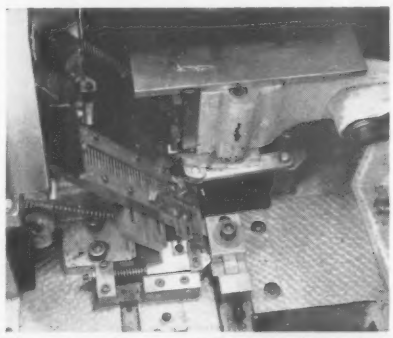

Figure 2 — Closeup of the magazines, clamp and die of the machine that bends two pump rods simultaneously in a Nilson machine equipped for automatic feed and rapid operation. Two rods are bent at the same time by rocking elements actuated by links attached to the rear slide at right. * * * * *

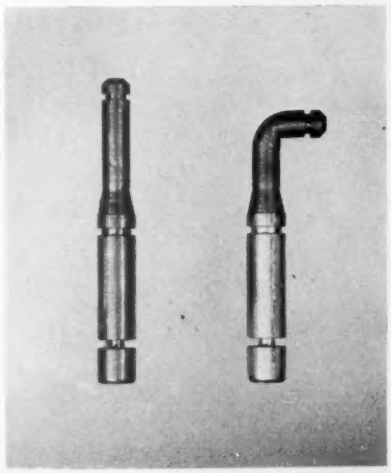

Figure 3 — 7/32-in. pump rods as they appear before and after bending, by methods described in the text, after the rods are turned, grooved and cut off in a screw machine. The inside corner at the bend is square but the outer bend is given a radius by slide operated rockers. * * * * *

As Fig. 3 indicates, the blank, made from 7/32-in. bar stock, is necked to 5/32-in. dia. over a 5/8-in. length at the end to be bent and three narrow grooves are turned, one near the center and one close to each end, before the length is cut off in a screw machine.

* * *

To avoid thinning out at the bend, a rocker, pivoted as shown in the drawing, Fig. 4, is provided to swing around the outside of each bend where a true radius is produced. As two parts are formed at a time, there are two rockers, one at the right and one at the left of the bolster. Its front edge is recessed to fit the rear halves of the two surfaces that clamp the short ends of the two rods before and during bending.

* * *

On the front slide are mating recesses that fit the short ends and that are moved inwardly to clamp the two rods just before

the two bends are made. Endwise positioning of the two rods is by projections in the clamping recesses. One projection fits into the grooves near the small end of each rod. When thus clamped, each rod has its long end projecting to the side of the bolster. This end is then forced backward around a sharp edge of the bolster as the corresponding rocker is moved around a 90-deg. arc, producing the outside radius of the bend.

* * *

Rocking action is effected by the rear slide which is advanced to move the rockers by links as soon as clamping occurs. Right after the bends are made, the slides are retracted and, as the clamps open, the bent rods are released, falling by gravity into a chute, and the next pair of rods is fed to clamping position, one from each of the two magazines, to start the next cycle.

* * *

As Fig. 1. indicates, there is a syntron vibrated hopper above the machine and it feeds the rods into and along two tracks to a distributing point from which the rods feed into each of a pair of inclined magazines shown also in Fig. 2. Two rods are fed for each working stroke of the machine and the small end of each rod must be inward, with the small ends pointing toward each other, for proper loading.

* * *

Rods are merely dumped into the hopper and feed out on tracks. Some have small ends facing one way and some the other. As the rods drop from the two tracks and strike a baffle in the distributing device, the larger and heavier ends are lower. This results in the half having the heavy end at the right falling into the right magazine and those with the heavy end to the left into the left magazine, as desired. If hopper feed exceeds the bending rate to an extent that either or both magazines are filled and overflow, the excess merely spills onto a tray and is returned to the hopper as necessary.

* * *

Bottom outlets of the magazines are controlled by transverse slides cammed in by side shafts and so arranged that one rod at a time from each magazine can fall to clamping position. This occurs, of course, just after the prior pieces are released from the clamp. Normally, 40 pieces a minute from each magazine are bent, or a total output of 80 a minute, which is a high rate and far greater than for punch press bending setups. Moreover, not more than half of one man's time is required, this chiefly to keep the hopper supplied and to check machine operation. Labor charges per piece is therefore exceedingly low.

* * *

Beside tending the above setup, the operator has time to tend one or more other machines, such as the Famco press, set up as in Fig. 4. On the bed of this press is a die designed to make right angle bends at both ends of short rods after they are fed horizontally one at a time by an air operated plunger arranged below the simple magazine and hopper at the right. This plunger is timed to push each rod into a slot in the cylindrical central holder of the die and leave its ends projecting the precise distance required at each side of the holder.

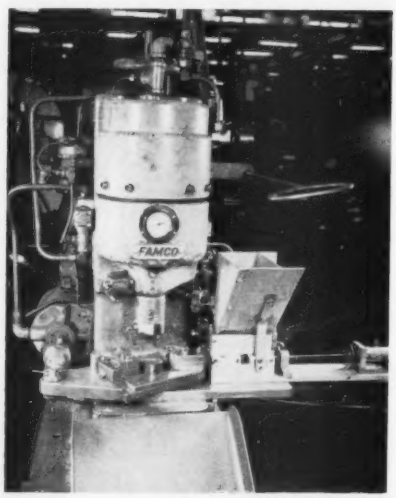

Figure 5 — In this press, fed from a hopper by the air operated plunger at the right, 90 deg. bends are made at both ends of rods clamped in the center holder as the die is rocked horizontally about the holder by the air plunger at the left. * * * * * *

As soon as the rod is in position, the press ram is lowered to clamp the rod. Thereupon, the plunger of the air cylinder back of the press at the left is advanced and rocks the side portions of the die about a vertical axis. This causes

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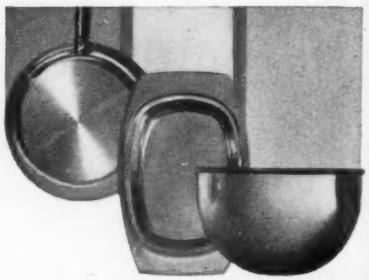

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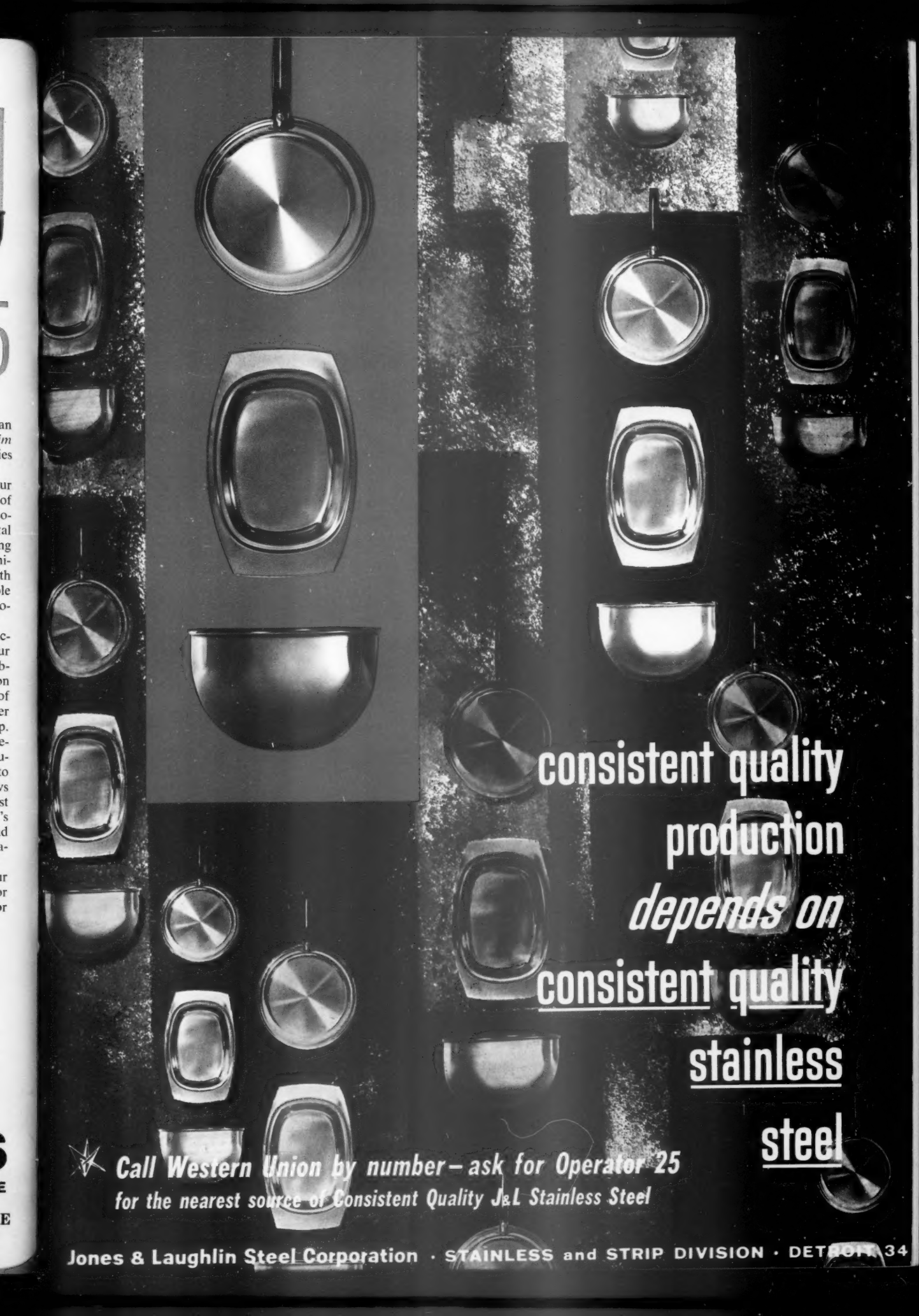
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New Continuous Casting Process for Copper Wire Bars

by A. I. Nussbaum
Vice President
Loma Machine Manufacturing Company
New York, New York

This article describes a wire bar continuous casting machine said to embody features that increase production and are of a practical nature.

One of the most significant advances in copper wire bar casting technique recently developed has resulted in what is believed to be the world's most productive and versatile fully continuous bar casting machine. Four of these casting units have already been installed by a leading copper producer in the United States, and two additional machines are currently being built for use in England and Australia. The equipment handles copper in all its various forms — from phosphor de-oxidized and oxygen-free to fire refined and tough pitch. The basic design of the machine also lends itself to the casting of brasses, bronzes, aluminum and magnesium alloys. The shapes produced on the unit, in addition to wire bars, include round piercing and extrusion billets and rectangular slabs. The production capacity of the machine ranges from 3 tons per hour for double strand casting of 3 in. diameter billets to 10 tons per hour for single-strand castings of 5½ in. x 33 in. slabs.

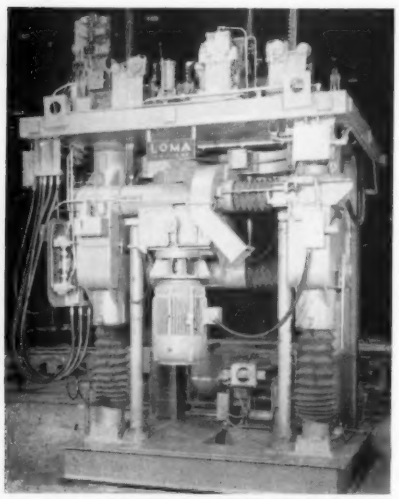


Figure 1 — Overall view of Continous Casting Machine for the production of wire bars, billets and slabs. * * * * * * *

Metal Supply

This continuous casting machine is usually fed with liquid metal from either an arc or induction melting furnace followed by an induction holding furnace. The molten copper at a temperature of 2150°F then flows through a special refractory-lined distributor equipped with down spouts extending into the molds. The rate of flow of the metal through the down spouts extending below the metal surface is controlled by the operator with needle valves. This "underpouring" method assures a smooth, splash-free entry of clean metal into the mold cavity, thus eliminating internal porosity and inclusions in the cast material.

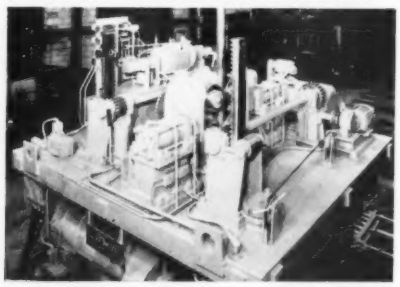


Figure 2 — Upper casting machine level, showing the withdrawal of a solidified billet by the two pinch roll sets. * * * * *

Mold Design

The molds are of copper construction and are mounted at the top of the casting machine. The mold water jackets feature a special internal baffle design which greatly enhances their heat removal capacity. The cooling water initially flows through the mold jackets and then emerges from an adjustable slot at the mold bottom to impinge on the solidified metal surface in direct spray form. The spray water is collected in a water box mounted below the molds and is recirculated.

* * *

To prevent sticking of the cast copper to the mold and to assure a smooth metal surface, the entire mold assembly is oscillated by a reciprocating gear. The vertical stroke is only a fraction of an inch, and the rate of vibration can be adjusted up to several hundred cycles per minute by means of a variable speed drive.

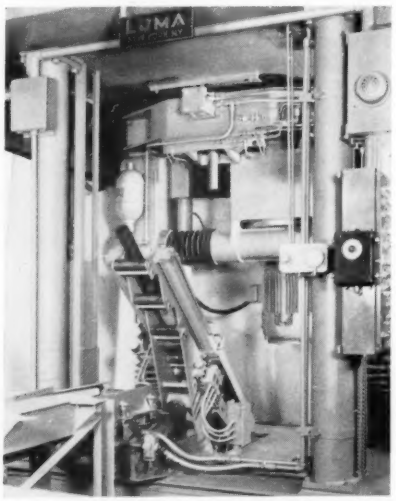


Figure 3 — Lower casting machine level, showing a cut billet being removed by the tilting discharge basket. * * * * *

Pinch Rolls

The solidified metal strands are continuously withdrawn from the molds by a double set of 9 in. diameter pinch rolls made of stainless steel. Proper clamping pressure is applied to the pinch rolls by opposed hydraulic cylinders and, in addition, spring pressure is provided to hold the stock firmly in cases of power failure. The pinch rolls are driven through reduction gearing by a 5 h.p. d.c.

(*Please turn to Page* 520)

New Modern Magnet Wire Plant

This is largely a picture story of a magnet wire plant said to be ultra-modern in layout and equipment.

Outgrowing its old facilities, the **Viking Wire Company,** a progressive manufacturer of magnet wire, recently completed the construction of and now is occupying a new 40,000 square foot plant in Danbury, Connecticut, to house its expanding operations. Since the establishment of the business in 1952, production has increased by some 1500 percent.

* * *

The new plant, one of the most modern in the magnet wire industry, is operating with three shifts, seven days a week, in producing nine basic types of magnet wire, which include insulations of Polyurethane, Formvar, Nylon, F-Bondall, Isonel, Enamel, Nyform

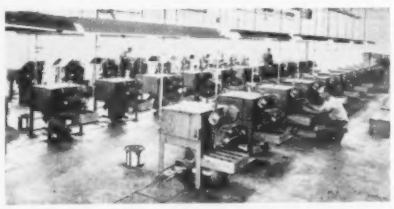


Figure 2 — General View of Wire Drawing Room.

and Nylon-Poly. All operations incident to the manufacture of magnet wire, from wire drawing to insulation, are performed.

* * *

The new plant is air-conditioned, has its own research laboratory to assure conformity of wires to military and NEMA specifications, a cafeteria, a machine shop, and 100% inspection procedures for all of its output. Careful temperature control is maintained in the plant, and all facilities are electrically controlled for automatic

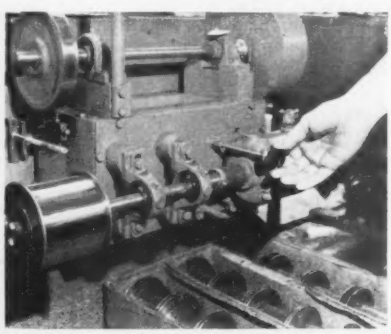


Figure 3 — Fine Wire Drawing Machine.

Figure 1 — Viking Wire's New Plant.

and semi-automatic operation of the various machines used in manufacturing these wires.

* * *

Built on a 35-acre tract, the plant is designed for further expansion. The latest in modern equipment is used, and plans are now being readied to install catalytic combustion units to eliminate the noxious fumes that result from enameling operations. The plant is designed for maximum efficiency in the uni-directional flow of work; no double handling of products in production is required.

* * *

The magnet wire industry, which is expected to gross around an $88 million sales volume in 1960, now is 60 years old, but has had its greatest growth and development in the last five years. Magnet wire is a product that is basic to the fabrication of electrical and electronic equipment. The industry is one in which, as new wire insulations are developed, additional markets are expected to develop for the use of its products. Whereas only two basic products were in general use in 1950, more than ten magnet wire types are made today.

* * *

Magnet wire is used for electric motor windings, coils, and transformers, some of the bare wire being drawn to triple-0 diameters. Electric current conducted through these insulated windings creates the forces that operate everything from household refrigerators to complicated electronic components and guided missiles.

* * *

There often are hundreds of miles of magnet wire in such products as telephones, power mowers, outboard motors, jet planes, television sets, and so forth. In fact, almost anything electric that one can observe employs magnet wire in one of its components.

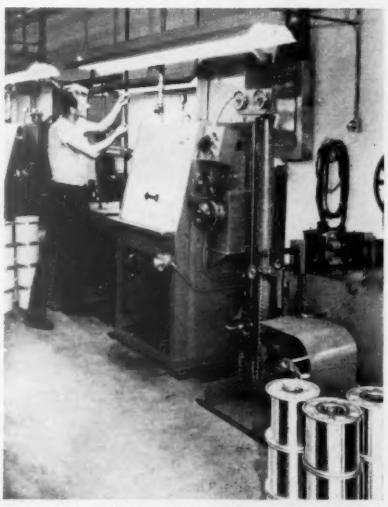


Figure 4 — Intermediate Wire Drawing Machine.

* * *

Officers of the firm are **John W.**

(*Please turn to page* 519)

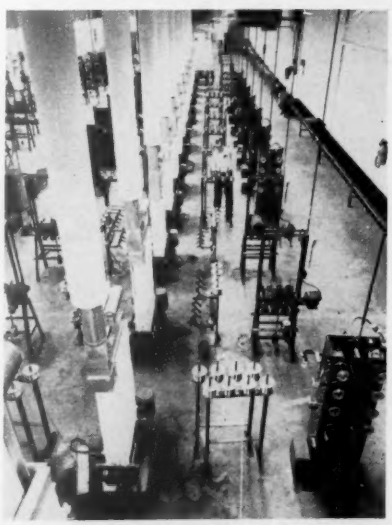
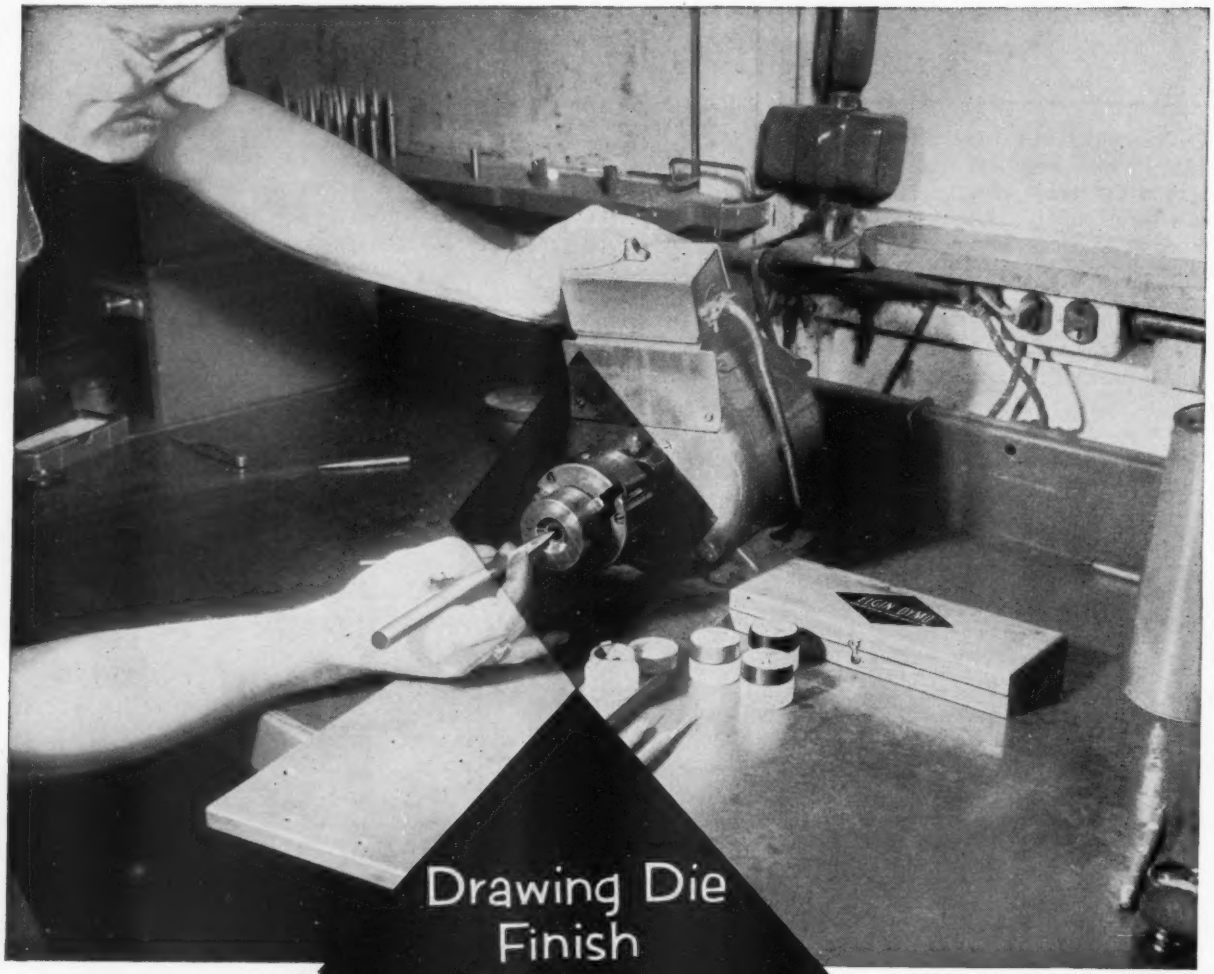


Figure 5 — Looking down the Enameling Room.



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Extended Field Testing of Stainless Wire

by R. E. Paret
Stainless Steel Specialist
American Iron and Steel Institute
New York, New York

The test results on stainless steel wire in actual use over a period of 20 years are reported in this article.

Corrosion resistance is an accepted attribute of the stainless alloys. Evidence supporting existance of this valuable property relies on laboratory tests, simulated service tests and on actual service behavior. Corrosion engineers rightly prefer the extended-service field test, for they recognize the influence of numerous and uncontrollable environmental factors in altering corrosion resistance. Available now are test results describing response of stainless Type 304 wire cable to 20-year exposure under moderate-to-severe service conditions.

* * *

Within the limits of engineering practicality, control of water flow on the upper Mississippi River is one responsibility of the U. S. Army Corps of Engineers. Toward this end, a network of locks and dams has been erected during the twentieth century.

* * *

Each installation includes provision for regulating water volume past the dam site. One such installation is Lock and Dam No. 10. It is situated on the Mississippi River near Guttenberg, Iowa, and about 225 miles south of the Twin Cities within the limits of the St. Paul District of the U. S. Army Engineers.

* * *

Day-to-day water regulation through a lock culvert is accomplished with the aid of a 12-ton taintor valve mechanism, of design common to other lock sites. The valve is buried within the lockwall, hence must operate with little or no maintenance.

* * *

As may be seen from Figure 1, the taintor valve resembles a segment of a cylinder. The cylindrical surface faces upstream. Vertical movement of the valve determines the water volume entering

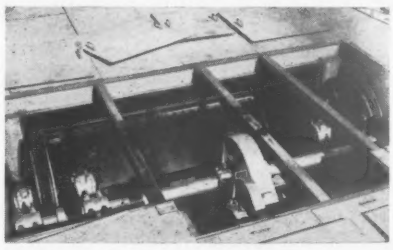
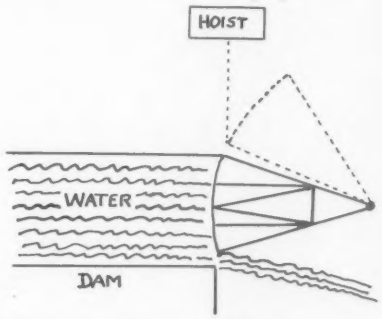


Figure 1 — Taintor Valve Mechanism, located beneath deck plates (removed), controls flow of water through lock. Stainless Type 304 cables supporting valve withstood 20 years' service without sign of corrosion. Below: Sketch showing arrangement of valve and cable. * * * * * * * * * *



or leaving over the lock.

* * *

Twin cables wound over two 54-inch diameter drums actuate the taintor valve, which weighs 24,744 pounds. Cables attach to the lower front corners of the valve. The pivot upon which the valve rotates is designed to carry part of the 12-ton load, with each 1-inch diameter cable supporting an estimated 8500 pounds.

* * *

River water contacting valve and wire cable contains moderate to heavy silt in suspension, depending upon the season of the year. Dissolved minerals and gases also present may be considered corrosive, under certain conditions.

Choice of Stainless

Stainless Type 304 wire was selected for the cables that lift and lower the taintor valve. Reasons for its selection were threefold. Table I details the original purchase specification.

Table I

Original Purchase Specification*

Cable, steel, corrosion-resisting, extra flexible, 1″ diameter, 6 x 19 construction with 7 x 7 corrosion-resisting independent wire rope center; in strict accordance with Navy Department Specifications 22C4A, Type 3.

* Produced by Rock Island District, U.S. Army Corps of Engineers, order contract W-741-ENG-1759, dated November 1936.

* * *

First, the obvious requirement of resistance to environmental damage. Four conditions require consideration: (1) the silted water, and its contents, (2) the climate which varies widely from season to season with temperature extremes from —30° to 100°F., (3) long-term exposure to drum greases and lubricating fluids needed for efficient hoist operation, and (4) also associated with the drum, abrasion of outer wire layers during winding and rewinding of the stainless cable.

* * *

Second, stainless rope was selected for its strength. Load of 8500 pounds was considered minimum. Water pressure on the taintor valve could be expected to increase this pull somewhat. Starting and stopping stresses, while lifting and lowering the valve, create momentary loads much beyond the 8500 pound static pull. Acceptance testing under the original specification called for a breaking strength in excess of 85,400 pounds, far in excess of that anticipated in service.

* * *

While several other materials may be reeved into rope capable of initially withstanding such stresses, loss of strength in serv-

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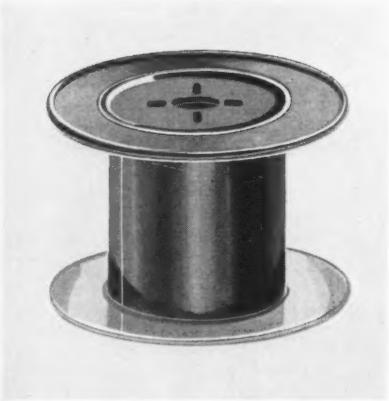

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ice would be a natural consequence as corrosion proceeded.

* * *

Third, the favorable strength/weight ratio of stainless alloys encouraged the metal's selection. Other materials capable of supporting the 12-ton valve for years would require a more costly, heavy-duty hoist mechanism, because of cable weight and bulk.

Service Conditions

From Figure 1, it will be noted that three sets of service conditions prevailed: (1) continuous submersion in river water with a straight pull of about 8500 pounds, (2) exposure to normally varying climatic conditions, and slight flexing under an 8500 pound static load, and (3) exposure to lubricants and greases needed for hoist operation, plus repeated flexion under an 8500 pound load while stretched over a drum diameter of 54 inches.

* * *

In 1957, after 20 years' service, the U. S. Army Corps of Engineers removed the cables for detailed examination. Three 15-foot lengths, representing each type of service, underwent extensive mechanical and chemical testing.

Test Results

Each rope sample was tested to determine its breaking strength,

TABLE II

MECHANICAL PROPERTIES OF STAINLESS CABLE AFTER 20-YEAR EXPOSURE

	Wire Diameter Inches	Tensile Strength P.S.I.	Average tensile Strength, P.S.I.
Drum End Section			
Main Strands			
Main Strand Center Wire	.073	255-319,000	287,000
Main Strand Inner Wire	.070	242-312,000	276,150
Main Strand-Small Outer Wire	.054	272-285,000	277,350
Main Strand-Large Outer Wire	.073	233-312,000	263,000
7 x 7 Core			
Outer Strand-Center Wire	.044	256,000	-------
Outer Strand-Outer Wire	.040	245-265,000	254,700
Core Strand-Center Wire	.050	290,000	-------
Core Strand-Outer Wire	.044	243-252,000	245,700
Under-Water Section			
Main Strands			
Main Strand-Center Wire	.073	316-320,000	318,000
Main Strand-Inner Wire	.070	245-314,000	281,750
Main Strand-Small Outer Wire	.054	276-290,000	280,350
Main Strand-Large Outer Wire	.073	231-306,000	272,900
7 x 7 Core			
Outer Strand-Center Wire	.044	258,000	-------
Outer Strand-Outer Wire	.040	246-264,000	254,000
Core Strand-Center Wire	.050	284,000	-------
Core Strand-Outer Wire	.044	233-246,000	240,200

This section that was "under water" shows a slightly higher tensile strength than the "drum end" section.

then unreeved and individual wires were tested for appropriate mechanical properties (see Table II). A section of each rope sample also received chemical analysis (see Table III).

TABLE III

CHEMICAL ANALYSIS OF STAINLESS CABLE

	Wire Diameter Inches	Carbon	Chromium	Nickel
Main Strands				
Main strand-C.W. & Large O.W.	.073	.13	18.33	9.20
Main Strand-I.W.	.070	.15	18.57	8.82
Main Strand-Small O.W.	.054	.11	17.61	8.94
7 x 7 Core				
Core Strand C.W. and Outer Strand C.W.	.044	.06	17.25	9.09
Outer Strand O.W.	.040	.11	17.97	8.85

Phosphorous, Silicon and Selinium, all less than .07.

Breaking strength of the sample removed from underwater service was 91,050 pounds, while that exposed to atmosphere was 91,350 pounds. Rope section wound around the drum hoist developed a breaking load of 90,200 pounds. Breaking strength specified in the original acceptance testing specification (Navy Spec 22C4A) was 85,400 pounds.

* * *

Gross appearance of each sample was normal. Nominal rope diameter was 1 inch, plus or minus 1/64 inch in those two samples exposed to water and to atmosphere. Rope lay of samples exposed to water and to air was 6.50 inches, while lay of drum-wound rope was 6.60 inches. Some interstitial openings could still be noted in the sample removed from water.

* * *

No internal wire failures were found in any sample. External wire failures were absent, except in the sample exposed to water; a crown fatigue type fracture was seen in one wire of one strand.

* * *

Abrasion was noted only in the sample flexed over the drum hoist. Crown wear in this one sample was light, and amounted to a four percent reduction in the original wire diameter.

* * *

Upon the sample submerged in

(*Please turn to page* 522)

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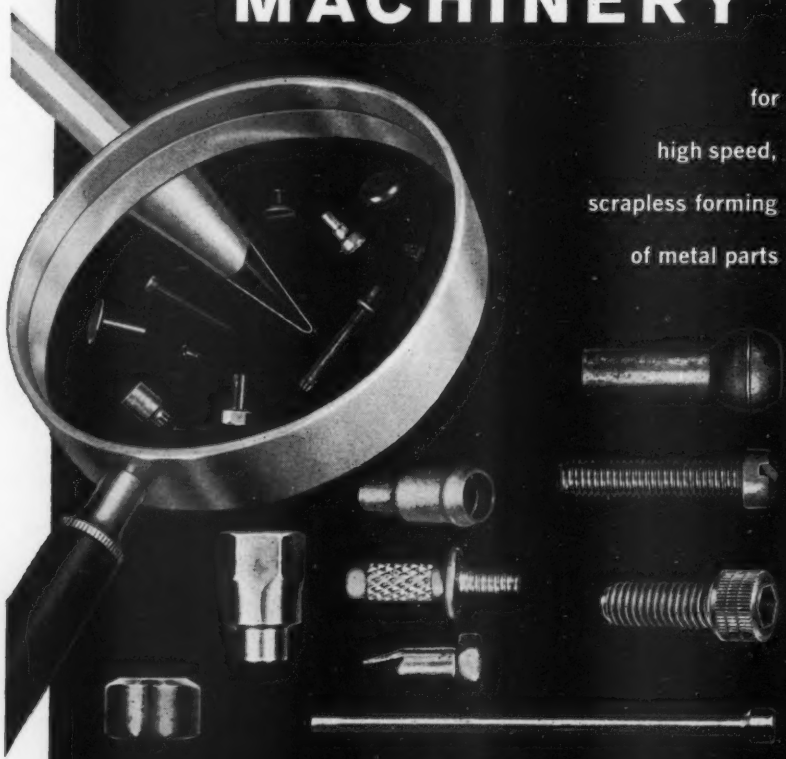

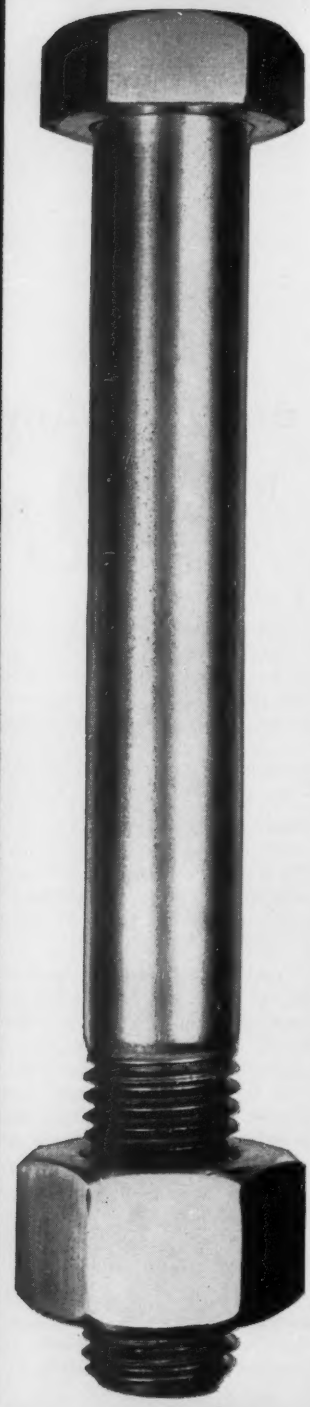

*includes: cold headers (single or double blow) progressive headers, nut formers, parts formers, thread rollers, slotters, trimmers, and pointers; also special purpose headers and auxiliary equipment

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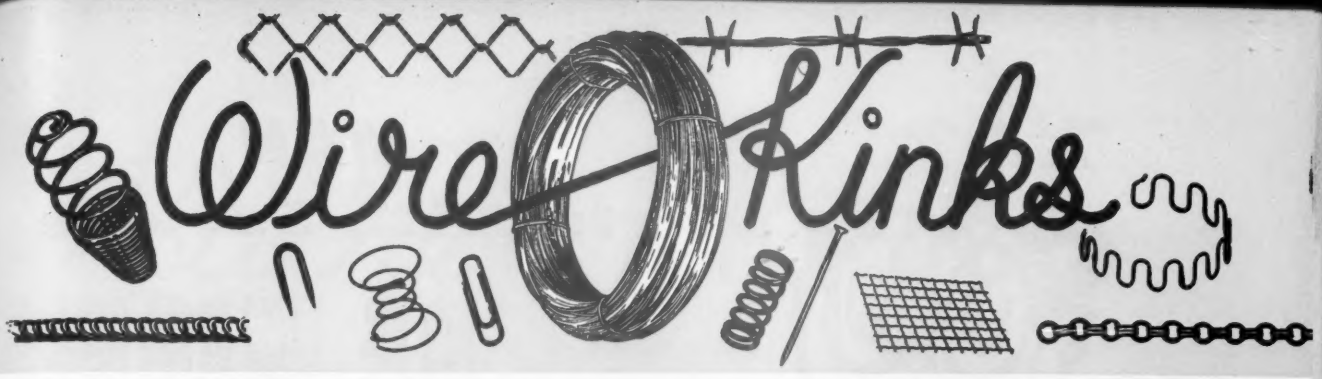


In this department will be published helpful hints on how to do things and the questions asked by our readers on wire processing problems, together with the answers and comments thereon received from the field. In no instance will the identity of the persons asking for advice or of those supplying it be published.

Our readers are invited to send helpful contributions and to submit questions on their technical problems to the Editor. These will be answered from information on hand or from the field, when it becomes necessary to secure counsel from that source.

Rope Wire

Questions

Could you give me advice on a number of points in connection with wire rope?

1. What is the effect of decarburization on the life of the rope?

2. What effect does the manganese content have on rope wire?

3. What effect does hot dip galvanizing have on rope wire and does this process induce brittleness?

Answers

Reply No. 1

1. Considering rope wire itself, decarburization of any type or to any extent has a detrimental effect upon its fatigue life. Total decarburization should never be associated with a high carbon rope wire, and, of course, with proper wire rod and wire making practice, will never become a factor to be considered. Partial surface decarburization is probably present to a small extent in most grades of commercial rope wire. Unless extreme care and special methods of preliminary treatment are resorted to, its presence is unavoidable. However, so long as it does not exist in the wire to too great a depth, I believe that its effect upon the fatigue life of the finished wire rope is negligible and need not be considered. I hold this opinion because of the many other factors involved which are of greater importance. Among these may be mentioned the construction of the strands of the rope, the strand and rope lays, the nature of the wire rope center, and unpredictable service conditions to which the wire rope is subjected.

* * *

2. I presume here that the reader has in mind the effect of differences in the manganese content upon the general quality of rope wire of a given carbon content. With a given carbon content, the 0.3/0.7% Manganese and the 0.7/1.2% Manganese steels will give rope wire of equal quality provided the Final Patenting is proper and efficient. The big difference between these two steels lies in their response to patenting. The higher Manganese steel will generally respond better giving, under a certain set of patenting conditions, a more desirable grain structure for subsequent cold drawing. In other words, it is, shall I say, easier to patent the higher Manganese steel. Lead, or molten salt, quenching following the patenting heating cycle will generally result in a more satisfactory and serviceable rope wire.

* * *

3. The question of brittleness of steel wire at hot galvanizing is one upon which I cannot briefly comment because of its complex nature and the multitude of factors which can be and are involved.

Reply No. 2

1. We are not in position to give you information concerning surface decarburization on the life of ropes.

* * *

2. The manganese content of steel wire influences the cooling rate which is dependent, to some degree, upon the cross section. In our rope wire steels of .55 to .80% carbon we hold the manganese to a range of .55 to .70%. We do not hesitate to air cool from a patenting temperature of 1750°F in all sizes down to .65"; all sizes smaller are quenched in lead at 1000°F.

* * *

In the spring steels of .65 to .75% carbon with .80 to 1.00% manganese the critical size is .120". In both cases, air cooling wires smaller than the critical sizes will produce extremely brittle sections with no ductility whatever. The tensile strength of the wires properly patented will be in the range of 150,000 to 165,000 psi, whereas the severely quenched wires would probably be well in excess of 300,000 psi.

* * *

3. We assume that the reader has in mind the hot dip galvanizing of high carbon steels. We have found that we have reduced the possible embrittlement in the zinc pan by using a fine grain steel patented 1750°F and quenched in lead at 1000°F and restricted the total drafting to a maximum of 80% in drawing the wire. The length of time which this material is in the spelter pan has great bearing on the possible embrittlement. When the temperature of the wire in the spelter pan reaches approximately 700°F, embrittlement is a possibility. We have found a great deal of success in running this type material by the Hermanized method at takeup speed of 40 to 60 FPM, depending on the size of the wire.

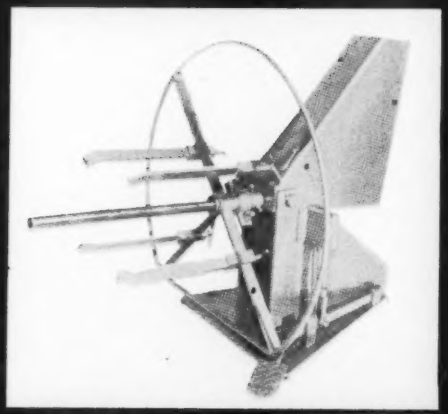
Reply No. 3

1. We know that decarburization reduces the life of wire rope — both wear and fatigue. As to how much is a moot question.

The Wire Machinery MAN...
Starts With Service

BE WISE

"Buy quality and service when you equip your plant. We offer selected-proven machinery to meet the Wire Industry's needs"



LARGE AND SMALL TILT REELS
ONE MAN LOADING — 350 POUND COILS — FULL BRAKE — SAFETY — FAST

7 TYPES OF BENDERS
A PERFECT MACHINE — LARGE WORKING TABLE — ONLY 3 MORING PARTS EASY SET-UP — FAST

5 More Exclusive Machines

- WIRE STRAIGHTENERS AND CUTTERS
- THREAD ROLLING EQUIPMENT
- DEAD BLOCKS
- WIRE DRAWING AND MECHANICAL DESCALING
- RE-BUILT WIRE MACHINERY

Wire Machinery Inc.

5407 SOUTH KNOX AVE. CHICAGO 32, ILLINOIS
POrtsmouth 7-2508

Wire Kinks

2. We favor lead patenting — it gives us better rope service. Torsions are a little lower, however. We have never used high manganese even when we used air patenting. With lead patenting we favor lower manganese.

* * *

3. We have always favored "pigtail tests", and where we have done that have had no marked difficulty.

Stainless Steel Wire

Question

I would like to obtain information regarding the strand-leading of fine stainless steel wires as to flux, temperature, speed through bath, etc.

Reply No. 1

The wire is first fed through a flux tank holding a water solution of Dupont's zinc ammonium chloride. Ordinarily, a concentrated solution is used. The wire then enters the lead bath, which is heated up to 800°F to 850°F. The lead contains 1¾% to 2% tin. No charcoal cover or any other cover is used on the bath. As the flux carries over from the flux tank, it is necessary to provide a dam on the lead bath so that the flux is not in contact with the wire as it leaves the bath.

* * *

It is a very simple operation, and the above information covers it adequately.

Reply No. 2

Lead has the disadvantage that wire smaller than .100″ cannot be batch coated, because strands tend to bond together. Also the lead coat shields the wire surface so that relatively little surface smoothing is accomplished. Lead drawn wire must be stripped before annealing.

* * *

Oxide coating approaches lead in suitability for multiple or heavy passes, but is most effective below .200″ round. It is of limited value in drawing shapes on hot rolled rod. It must not be removed before annealing. Some steels, notably Type 431, are embrittled by zinc and it is important that cold drawing lead be free of this element.

Wire Flattening Calculations

Question

We are interested in obtaining a Conversion Chart listing the diameters of round wire necessary to reduce to a given flat size; e.g., the size of the round wire to produce a ½″ wide x .062″ flat wire, or the round wire diameter it would take to obtain a 5/16″ x .050″ flat wire, etc.

* * *

Is such a chart available and, if so, where can it be obtained?

Answer

We do not know of such a chart, and we doubt that one would be practical since there are several factors governing the size of the round wire, such as roll diameter, roll finish, rolling lubricant, kind of wire, wire hardness and roll material.

* * *

As a general rule of thumb we add the width of the rectangular wire to the thickness and divide by two to find the minimum diameter of the starting size.

* * *

For example:

Size of finished wire = .280″ x .100″
Minimum size of round wire = .280″ +.100″ = .380″. .380″ + 2 = .190″

This figure (.190″) is usually multiplied by a factor which would vary between 1.0 and 1.2 depending upon the conditions stated above. An average of 1.1 could be used for preliminary calculations.

Basic Steel Wire

Question

Could you give me information on the manufacture of round wire — soft basic and high tensile?

Reply

Basic steel is made by the open hearth or Bessemer processes for making low carbon steel. The furnaces are lined with dolomite and the process is characterized by the predominance of the basic oxide CaO, MgO and MnO in the slag. The high lime content in the slag is necessary for the reduction of the quantity of sulphur in the steel. Sulphur makes steel brittle.

* * *

The making of wire starts with the heating of billets and hot rolling them into wire rods. Such rods are heavily coated with an oxide scale, which has to be removed by pickling in a hot dilute sulphuric acid or by one of several mechanical means, such as abrasive blasting or flexing the rods over sheaves.

* * *

From this point the cleaned rod, which may be from 15/32″ to 3/8″ in diameter, depending on a mill's requirements, is drawn into wire. The first drawing machine is called a rod-breakdown machine, which draws through a series of tungsten carbide dies to a size of about .128″. Reductions per hole are about 25% of the cross sec-

(*Please turn to page* 523)

New Vinyl Compound Available

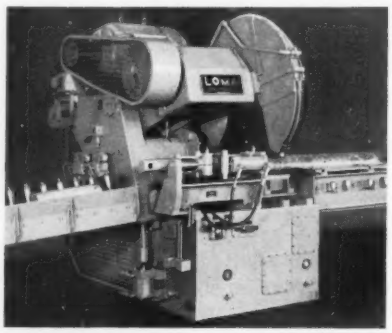
The commercial availability of Opalon 1040, an improved vinyl compound for wire and cable insulation, has been announced by **Monsanto Chemical Company's** Plastics Div., Springfield, Mass.

* * *

Martin G. Caine, product sales manager, said the new Monsanto vinyl compound has outstanding oven aging characteristics and conforms with the National Electrical Code THW classification established last year by the National Fire Protection Association, which provides for a thermoplastic insulation which is flame retardant, moisture and heat resistant and is suitable for service at 75°C in both dry and wet locations. It has excellent processing characteristics.

New Automatic Billet Saw

A single operator can now cut large aluminum alloy billets faster, with close length tolerances and ultra-smooth surfaces, due to the development of an automated cold cut-off saw by **Loma Machine Mfg. Co., Inc.**, New York 16, N. Y. The new equipment centers around the large, hydraulically operated circular saw shown in the accompanying illustration. Designed to cut aluminum alloy billets up to 16 in. diameter, the machine is equipped with a 48 in. diameter sawblade



48-in. Loma Circular Saw for cutting aluminum alloy billets, with feed and discharge conveyors.

driven by a 75 h.p. motor at speeds between 4000 and 8000 ft. per min.

* * *

The machine features a tilt arm, and the cut is effected through a downward movement of the sawblade. This revolutionary arrangement results in the feed pressure being taken by the rugged housing, eliminating any risk of chatter during the cut. The feed speed is steplessly adjustable, and the automatic return of the tilt arm occurs at high speed, holding idle time to a minimum. The sawblade rotates in such a direction that chips and coolant are carried away from the operator and are disposed of through an automatic chip conveyor.

* * *

Complete automation is obtained by operating the saw in conjunction with mechanical handling equipment consisting of a billet storage table with an escapement feed, a powered feed roller conveyor, an automatic length gauging stop and a gravity discharge roller conveyor. This equipment can handle billets up to 18 ft. length and 16 in. diameter.

LEGEND LARGE AND CLEAR ON INSULATED WIRE SURFACES — USE GILLIES MARKING

GILLIES CONCAVE AND FLAT MARKING WHEELS PRINT YOUR

WHEELS AND MACHINES FOR BEST WIRE IDENTIFICATION

MARKING WHEELS and MACHINES for ELECTRIC WIRE

THE BEAUTIFUL TOWN OF WEST BOYLSTON, MASSACHUSETTS WELCOMES INDUSTRY. INQUIRE FROM US.

U. S. Patent #2898848 & 2898849

Gillies Engraved Concave and flat marking wheels are widely used printing the I.P.C.E.A. color code, numerical, semi-spiral striped, dating, or manufacturer's identification, etc. on insulated wire, tubing or hose.

Machines print on ONE or BOTH SIDES in large legible letters. Wheels are adaptable to any machine—or we will supply the machines.

Wheels, shafts, ink pans and all accessories are readily removable for quick and easy cleaning.

Wheels are made of TOOL STEEL, HARDENED to Rockwell test 61-64 and HARD CHROME PLATED.

Send for samples of wire and prices on wheels and equipment.

"There is no substitute for QUALITY when combined with SERVICE"

DUNCAN M. GILLIES CO., INC.

P. O. BOX 181, WEST BOYLSTON, MASS.

Telephone: TE 5-4445

Film on Prestressed Concrete

A twenty-minute sound-color motion picture illustrating the ease of manufacture and the many in-use advantages of prestressed concrete in the building industry is now being made available for showings to interested groups by **The Colorado Fuel and Iron Corporation.**

* * *

The new film, "Building With Prestressed Concrete", illustrates how the use of prestressed concrete strand in concrete building materials increases strength and rigidity while providing for more efficient manufacture of such materials either at the fabricating plant or construction site. Prestressed concrete is being used increasingly in buildings, bridges, highway overpasses, etc.

* * *

"Building with Prestressed Concrete," 16mm. prints, can be obtained by written request to Colorado Fuel and Iron Corporation headquarters, P.O. Box 1920, Denver, Colo.

U.S.I. Offers New Form Of Polyethylene

Availability of a new powdered, low density polyethylene, dubbed "Microthene", was recently announced by **U. S. Industrial Chemical Company,** 99 Park Ave., New York 16, N. Y. It is expected to have many important applications, according to **Dr. Robert E. Hulse,** Vice President of National Distillers & Chemical Corp. and General Manager of the U. S. I. division, who made the announcement.

* * *

Initially, microthene will be manufactured in a semi-commercial plant having a capacity of two million pounds annually. Two types of the powdered form will be offered. One, made by a solution process, produces rounded particles 75 microns or smaller in size, and the other, made by a mechanical grinding process, produces particles of from 300 to 75 microns in size.

* * *

Many applications of microthene are foreseen, based on European experience, the material having

SUZUKI METAL is the foremost single producer in Japan of high quality steel wires, such as piano wire, piano string wire, telephone dial main spring wire, etc. Mass production facilities and craftsmanship at modern SUZUKI METAL plants guarantee premium steel wires, carefully controlled and labeled with the JIS Mark (Japan Industrial Standard).

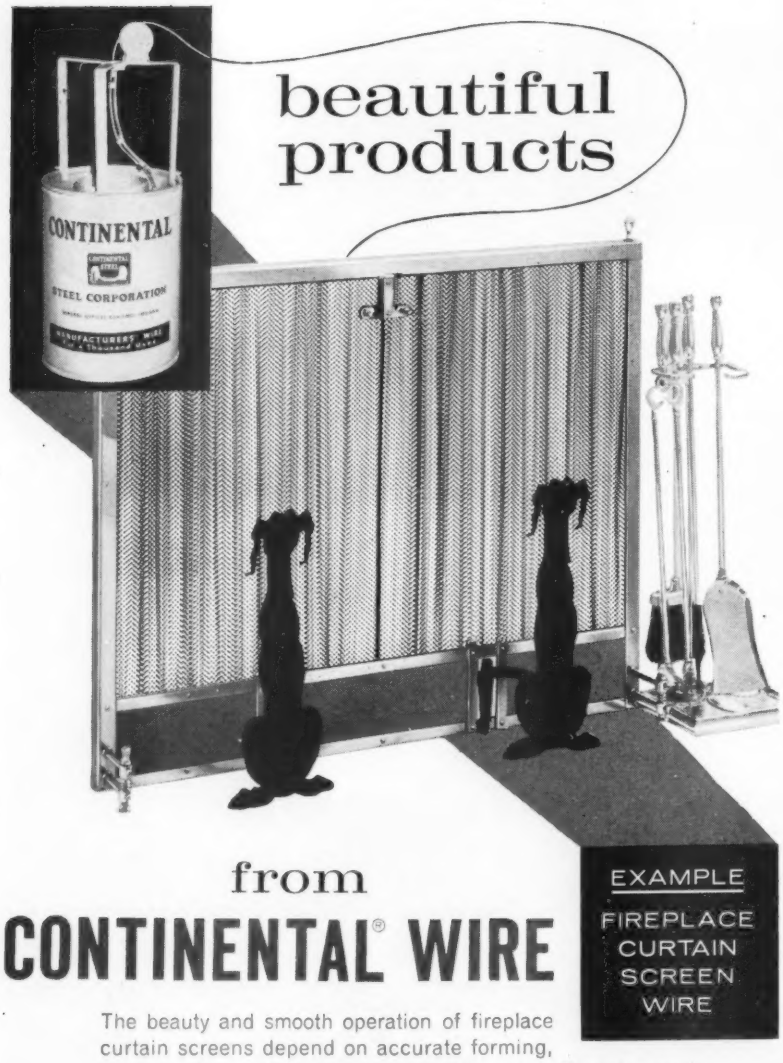
We are proud to have manufactured and introduced to the world for the first time the following products:

- Piano Wire
- Piano String Wire
- Telephone Dial Main String
- P.C. Wire & Strand
- Stainless Steel Wire
- Bead Wire
- Oil Tempered Wire
- Spring Steel Wire

For further information write to

SUZUKI METAL INDUSTRY CO., LTD.

1430, 2 Chome, Fukuro-machi, Tokyo, Japan.



beautiful products

from

CONTINENTAL® WIRE

EXAMPLE

FIREPLACE CURTAIN SCREEN WIRE

The beauty and smooth operation of fireplace curtain screens depend on accurate forming, even spacing, and neat appearance of the mesh. The wire used must be of correct temper, diameter and finish. Uniformity of these properties is of prime importance. Leading fireplace equipment makers choose Continental Wire because it possesses these features dependably, in coil after coil. The ability to take intricate forming is an important reason why Continental Wire is specified for scores and scores of other products made with wire. Continental Curtain Screen wire, 19 gauge through 20 gauge inclusive in size, is available in 500 pound to 650 pound catchweight single length coils packed in Leverpac Drums for faster weaving with less down time, cleaner handling and better storage. For wire in practically any size, finish, temper or analysis, in low or medium low carbon steels, see Continental first!

Fine Finishes in Manufacturers' Wire

CONTINENTAL STEEL CORPORATION

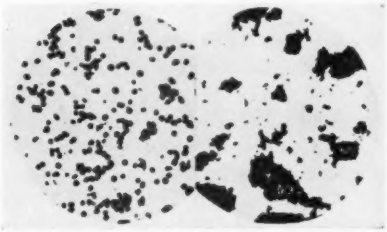
KOKOMO • INDIANA

PRODUCERS OF: Manufacturers' Wire in many sizes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright and special shaped wire. Also Welded Wire Reinforcing Fabric Nails, Continental Chain Link Fence, and other products.

been developed in Switzerland. Some of these are the coating of textiles, paper and metals, and the molding of large objects such as boats, tanks and drums.

* * *

Wire applications show promise, as in the coating of baskets, trays, novelties and other formed wire products, and in the coating of magnet wire. The material is not recommended for the extrusion coating of electrical conductors, as standard forms of pelletized polyethylene are considered better for this purpose.



Solution produced material (left) has small particle size (smaller than 200 screen mesh, or 75 microns) and a smooth surface. The mechanically ground material (right) has a larger particle size (50 to 200 screen mesh, or 300 to 75 microns), and an irregular shape and surface. Both types are expected to develop their own areas of application. (X 150). * * * * * * * * *

* * *

Applied to a preheated metal, the dry microthene powder forms a highly adherent coating with good protective and insulating characteristics. Sample quantities are available for evaluation.

Synthetic Protective Coatings For Wire Announced

Standard Industrial Compounds Company announces the successful application of their new line of Synthetic Protective Coatings. These coatings are easily adaptable to simple application and are nonreactive with non-ferrous metals, providing positive outside protection over periods of weeks. The protective coat does not interfere with stranding operations and the finish is nontacky. A complete line of compatible lubricants is available.

* * *

Further specific data is available from any of Standard's Field Service Representatives, or by writing to Standard's headquarters in Frankfort, Illinois.

S.I.C. Lubricants To Be Made In Spain

Standard Industrial Compounds Company, Frankfurt, Ill., has announced its entry into the foreign manufacturing arena.

* * *

An agreement has been concluded between Standard Industrial and a well-known Spanish manufacturer, **Revalorizacion De Grasas Y Ac'eites, S. A.** to produce the complete line of Standard's wire drawing lubricants for their foreign customers. Manufacture and shipments will be made, for the present, from the Regrassa plant in Bilboa, Spain.

New Precision Wire Winder

Associated American Winding Machinery, Inc., announces another "first" for its ME-301 electrical traverse "No-Dwel" winding machine. There has now been added to this Swiss-made high-speed precision winder a new and special accessory for perfect thread la[illegible]r winding. This accessory was developed by the engineering staffs of Associated American in New York and Chicago. It is believed that the ME-301 is the only commercially built winding machine now able to promise such perfect winding. Within the range of wire sizes .025" through .065" (#22-#14 AWG) perfect winding has been accomplished by the ME-301.

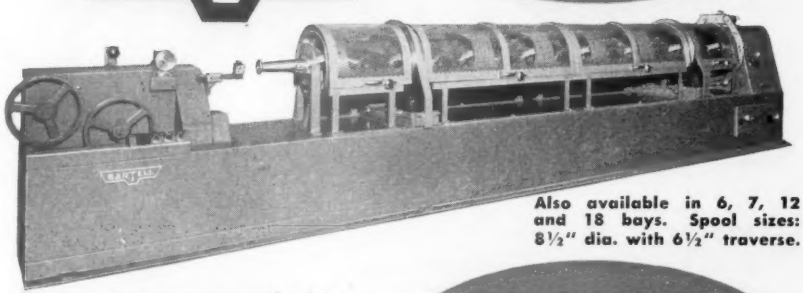
* * *

This revolutionary system of winding takes advantage of the fact that the ME-301 traverse is magnetic. It has no cams or gears. It responds rapidly to the electronic signal. With this system, instead of guiding the wire, the wire guides the traverse, switching the traverse on and off according to the position of the wire guide pulley. This is a free-floating pulley which positions itself according to the demands of the wire. This system provides perfect winding where wire tolerances are large enough to defeat precision positive guiding.

* * *

Perfect winding also involves spool construction. The take-up spool needs true flanges. A mini-

BARTELL FOR THE BEST



Also available in 6, 7, 12 and 18 bays. Spool sizes: 8½" dia. with 6½" traverse.

BARTELL SEVEN BAY HIGH SPEED STRANDER MODEL 7B-58-15

Frames are constructed of hot rolled shapes and plates to form a rigid box structure. Barrel is extruded 6062T-6 aluminum — Smooth starts through slip clutch driven by 7½ H.P. motor — Operators control station at front of machine — Main power control center at drive end — Electronically controlled automatic stop energizes solenoid operated brakes in event of wire breakage — Spool cradles and associated parts are completely interchangeable from one machine to another — Tungsten carbide wire guides throughout — Lay from ¼ in. to 5 in. long.

• CATERPILLAR CAPSTANS • SINGLE AND MULTIPLE HEAD RE-SPOOLERS • TAKE-UP & PAY-OFF STANDS FOR PLATING EQUIPMENT • WIRE STRANDERS

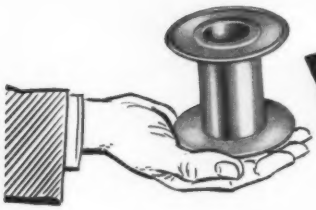
BARTELL TAKE-UP

This Take-Up is belt-driven, the drive originating from a slip clutch located outside the capstan box. Electrically operated traverse adjustable from zero to maximum reel width. Accommodates reels up to 30" dia. Speed selector sheave adjusts lay on reel to suit diameter of finished strand.

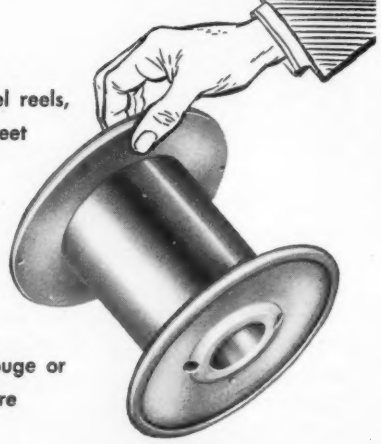
WE ALSO DESIGN AND BUILD SPECIAL EQUIPMENT TO MEET SPECIFIED REQUIREMENTS

BARTELL MACHINE-TOOL CORP.
YACHT CLUB ROAD ROME, N. Y.
• DESIGNERS • MANUFACTURERS • ENGINEERS • CONSULTANTS

Apco Steel Reels Meet ALL Specifications

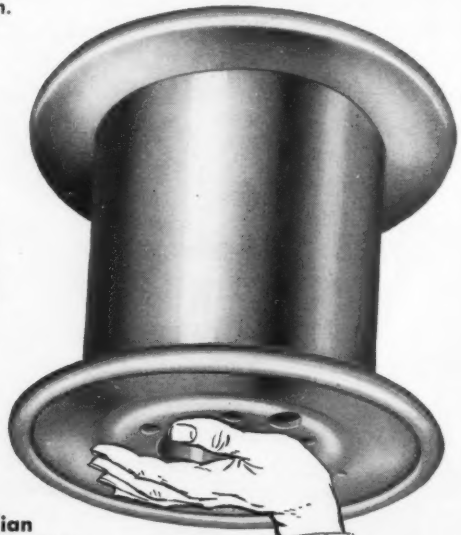


VARIETY



All Sizes . . . All Shapes of Apco steel reels, spools and bobbins are available to meet your exact wire handling and processing specifications. Designed and machined to close tolerances, Apco reels run true on the arbor for smooth spool-out at high speeds. Safe, strong, long-wearing all-steel reel construction gives you a production package that won't gouge or burr . . . stops breakage, trapping, wire waste . . . keeps machine downtime and maintenance to the minimum.

Tell us your wire or wire handling problems. Apco has the answer that will pay off in substantial on-the-line economies. Prompt delivery, too. Write, wire or phone collect.



Pacific Coast Representative:
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World Trade Center
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San Francisco 11, Cal.

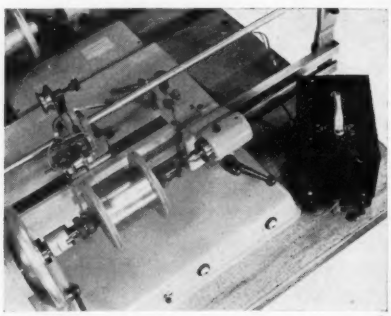
Canadian Representative:
HUGH P. WILLIAMS & CO.
47 Colbourne Street, West
Toronto, Ontario, Canada

APCO MOSSBERG COMPANY
LAMB STREET, ATTLEBORO, MASSACHUSETTS

mum fillet at the juncture of flange and barrel is necessary. Also necessary is a means of introducing a start wire so as not to interfere with subsequent layers. The supply spool needs to have been wound in such a manner that gross variations in tensions will not occur, as for example, from snag turns.

* * *

Associated American hopes to to be able to arrange demonstrations of this winding throughout the wire industry. For further information, address the company at 750 St. Ann's Ave., New York 56, N. Y., or 5935 W. Grand Ave., Chicago 39, Ill.



"No Dwel" Winding Machine * * * *

To Build Research Center

Naugatuck Chemical division, **United States Rubber Co.**, will construct a new technical center near its main plant in Naugatuck, Conn., to broaden research for new products and speed technical service for customers of the division's expanding line of chemicals, rubbers and plastics.

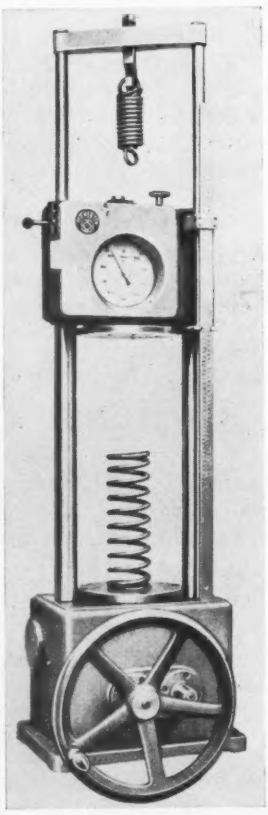
* * *

Engineering for the new structure is now underway. Construction will begin in mid-1960 and completion is scheduled for 1961. It will have a two-fold purpose, according to **Dr. Wesley S. Coe**, Naugatuck's director of research and development, who will be responsible for the new facility. First, it will expand the division's facilities for the development of new products. Second, it will expand and improve the division's technical service to customers by broadening its facilities for physical testing, compounding and other forms of product evaluation.

The center will have approximately 37,000 square feet of floor space equipped with the most modern machines available for testing rubbers, chemicals and plastics. It will also house equipment on which new products can be produced and tested under operating conditions that simulate actual production line techniques It will be staffed with about 100 scientists and technicians from the division's research and development department.

Heavy Duty Spring Tester

This new type hand operated precision spring tester is used for checking the loads and deflections of large heavy duty compression and extension springs with loads up to 2500 pounds. Such springs



are often used in autos, trucks, tractors, guns, aircraft, railroads, elevators and industrial equipment.

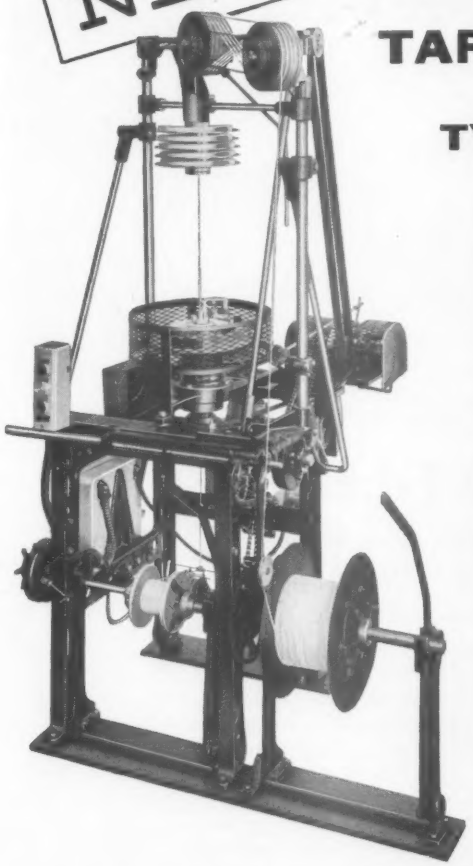
* * *

A large handwheel operates a gear drive with two speeds so that one turn of the handle can move

NEW **WARDWELLIAN®**

TAPE SERVER

TYPE N.T.T.



for Teflon, vinyl, and many other types of tape within specification range.

- Serving head speed adjustable from 375 RPM to 1200 RPM, dependent upon character of material.
- Maximum diameter of flexible conductor ¼".
- Takeup adjustable for any desired lay with tapes up to ½" maximum width.
- Supply package 7" maximum diameter, 3" hole.
- Rate of production dependent upon width of material and angle of lay.
- Machine equipped with "Varidrive" motor.
- Machine operation fully electrically controlled.
- Serving head mounted on heavy duty ball bearings.
- Serving head can be operated clockwise or counter-clockwise.
- Machine equipped with new type multi-groove takeup sheaves and idler pulleys insuring a uniform product.
- Improved wire payoff tension control.
- Counter furnished for measuring product in feet.
- Light windup for winding small conductors on small reels: also adapted for reels of 30" diameter and 13" overall width.

276-8 *Complete information available on request.*

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1212 HIGH STREET
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For Moisture Resistance, Specify

TEXTILENE
TWI-FLEX and TWI-WAX

Treated to reduce wicking and prevent leaching, lightly waxed Textilene Twi-Flex and heavily waxed Textilene Twi-Wax provide effective resistance to moisture. Both fillers are extensively employed for non-metallic sheathed cable (building wire), maritime shipboard cable, varnished cambric cable, and underground service entrance cable.

Twitchell's superior Textilene line also includes: Soft, dry fillers — *Twi-Port* and *Glascor** (Fiberglas-centered for high tensile strength without added bulk). Used for control, power, appliance, coaxial and communications cables, and all portable and flexible cords.

Fungus-resistant filler — *Twi-Tar*. Used for buried communications cable, expanded ACSR cable, and in other applications.

*Patent Applied For

For Every Wire and Cable Application
Twitchell's TEXTILENE Fillers Fill The Bill

Quality-controlled materials that are dependably uniform . . . in standard forms, or customized to special needs.

Assured supply from a reliable domestic source . . . always available in economical and convenient packaging.

Initial low cost with savings added by production efficiency . . . flexible, ready-to-use fillers that fit all equipment, handle and form easily, always maintain desired shape.

Proved performance as components of cables and wires that meet government specifications . . . stability shown by trouble-free installations in continuous service 20 years and longer.

FREE — SAMPLE SPOOLS of any type of Textilene filler to demonstrate the superiority of Twitchell materials in your operation — also technical counsel without cost or obligation. Just tell Twitchell your end-use requirements. *Write, wire, or phone today:*

E.W. TWITCHELL INC.

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PAPER PRODUCTS FOR THE WIRE INDUSTRY

Twisted • Folded • Pressed • Crushed • Shaped • Braided • Woven

the upper compression plate either ¼ or ¾ inch as desired.

* * *

To obtain the greatest accuracy, three easily interchangeable dial indicators with different load ranges are provided as follows: Low Range 0 to 250 lbs., Medium Range 0 to 500 lbs., High Range 0 to 2500 lbs., with each dial making 5 complete revolutions. Spring lengths up to 31½ in. are shown in decimals with a vernier reading in thousandths of an inch. Spring diameters up to 9-7/16 inches may be tested.

* * *

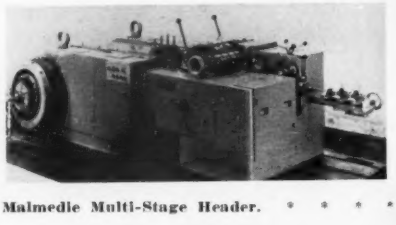
Bulletin available from The Carlson Co., 3457 Weidner Ave., Oceanside, L. I., N. Y. or phone RO 4-8181.

New Multi-Stage Header

Straus-Artys Corp. of 45 No. Station Plaza, Great Neck, N. Y., are pleased to announce that the Malmedie Multi-Stage Cold Transfer Headers made in Germany are now available to manufacturers in the U. S. A.

* * *

These machines come in several size models and are especially designed for the production of high-



Malmedie Multi-Stage Header. * * * *

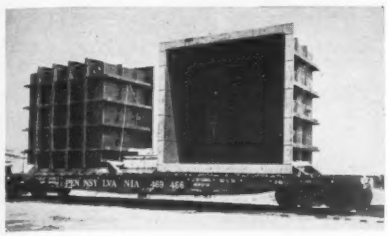
tensile screws, bolts and other complicated shaped parts. A separate similar machine is available for the manufacture of nuts.

* * *

These machines come with one shearing and four forming stages. Its new fully automatic feed indexing provides absolutely uniform blanks irrespective of timing. Strong shearing mechanism gives clean square cuts. There are separate adjustments of the ram slides and feed chucks. Also available is a ram-operated ejector for special shaped parts.

The closed frame construction, pre-assembled tool sets, swivel-mounted feed slides, variable speed drive, and many other important features are described in literature that is available upon request to Straus-Artys Corp.

Heilastic Lined Pickling Tanks Give Long Service



View above shows two tanks each 14½ feet long x 13 feet wide and 9 feet deep fabricated in **Heil Process Equipment Corporation's** structural shops. The inside of each tank was lined with 3/16" thick Heilastic 722 special sheet Neoprene Type Rubber for resistance to acid, oil, grease, abrasion, aging, cracking, ozone and temperature.

* * *

The outside of each tank was covered with 1/8" thick Heil Carbalt Mastic compound before shipment. After placement in the customer's plant, another 1/8" thick layer of Heil Carbalt Mastic compound was troweled on the outside of the tanks to protect them from splashing, etc., and the inside lined with acid-proof refractories.

* * *

The purchaser reports excellent results from these proven Heil materials. The tanks have been in continuous service pickling wire in a 20% solution of sulfuric acid at 180° continuously for more than three years without requiring any maintenance or repairs of any kind.

Wire Mill for Teheran

The Rhine Steel Industrial Planners, Dusseldorf, Germany, have closed an agreement with Edareh Taslihate Artech, Teheran, for the expansion of a metal smelting and foundry plant. It concerns the

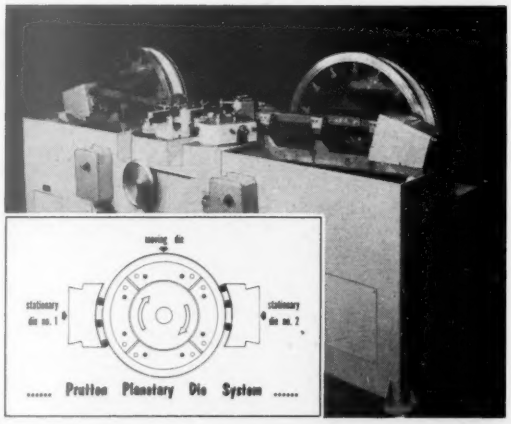
PLANETARY THREAD ROLLING MACHINE CUTS COSTS

Rolls Nails

48,000 PIECES PER HOUR

Designed exclusively for threading nails. This Prutton Planetary thread rolling machine can hammer up rolling production

500%



PRUTTON'S PLANETARY CIRCULAR DIE accounts for the tremendous increased production speed. Patented horizontal vibratory feed tracks feed nails to each side of the die in a continuous stream. The "lost motion" of the reciprocal type thread roller is completely eliminated.

Rolls nails at 600 to 800 pieces per minute. One customer reports a top speed of 1300 pieces per minute. A mere 150 pieces per minute represented top speed with this same customer on another make thread roller.

In addition to speed advantages the Prutton Model 125B-HV permits the operator to have complete access to the entire feed track and the inside of the hopper at all times. Total hopper capacity up to 150 lbs. Odd sizes and "bad blanks" can be quickly and easily removed without stopping the machine. There is absolutely no nail spillage. Working at this machine is like working at a bench. Loading height is a mere 36 inches.

HIGHER OUTPUT AND LOWER COSTS ADD DOLLARS TO YOUR THREAD ROLLING PROFITS . . .

A Prutton can be used for thread rolling, roll forming, knurling, marking, serrating and ne.king of nails, bolts, screws and special parts in a wide range of sizes. Send prints and/or samples for free estimates on machine costs.

Write or Phone for Cost Saving Information TODAY!

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5295 WEST 130th STREET
CLEVELAND 30, OHIO

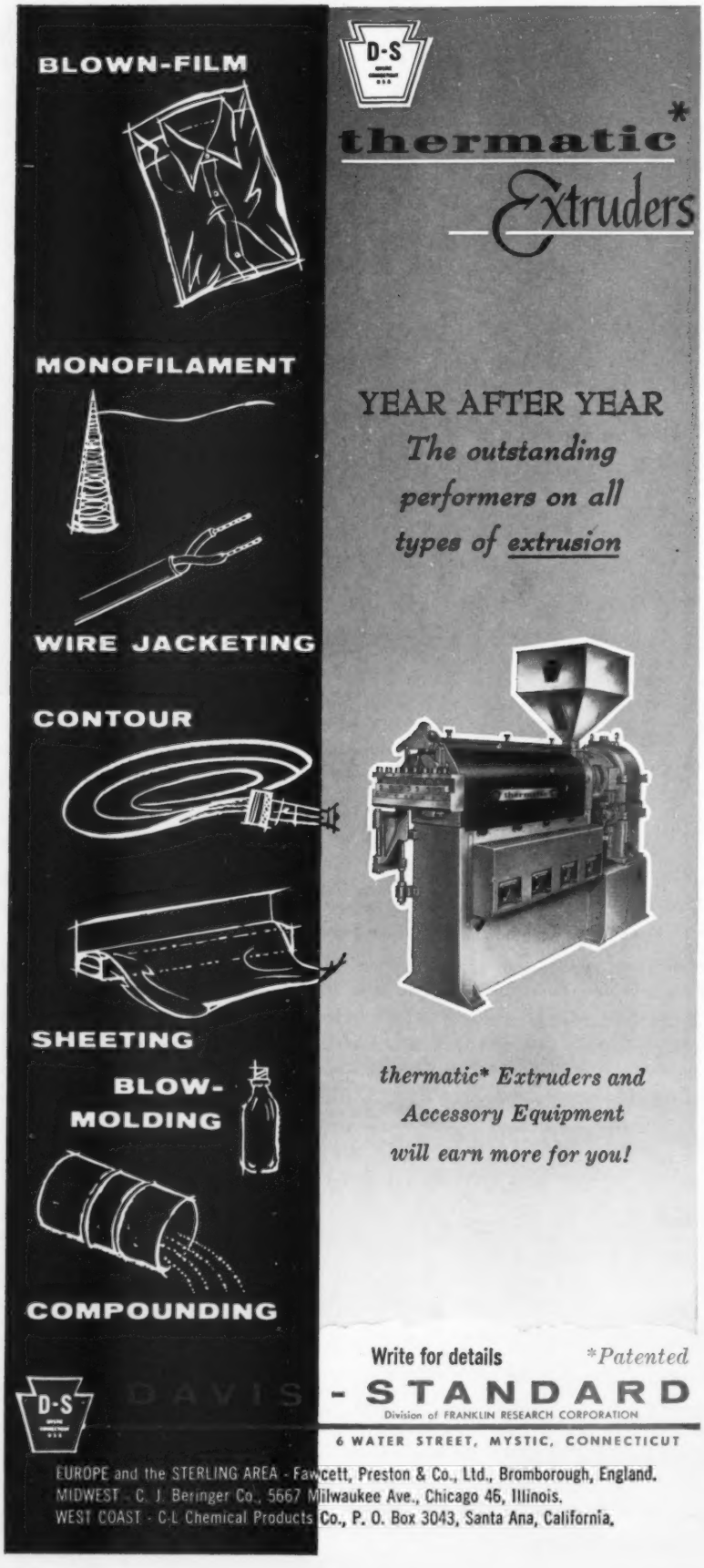
Leader in Planetary Thread Rolling

JUST PIN THIS COUPON TO YOUR LETTERHEAD

PRUTTON CORPORATION
5295 W. 130th Street
Cleveland 30, Ohio
Dept. WP

Please send information on Model 125B-HV Thread Rolling Machine.

Name ..... Title .....
Company .....
Street Address .....
City ..... Zone ..... State .....



establishment of a complete 600 mm strip mill, a 500 ton forging press, pipe and wire mills, as well as the associated heat treating furnaces. This contract, which involves expenditure of about 17 million dollars, includes the delivery of a 10,000 KW power station. Execution of the contract will be undertaken by specified German firms on an associated basis.

From Draht-Welt, December, 1959. Translated by Jerome W. Howe. * * * * * *

The Heated Wire Process

The purity of metals, so often discussed, is technically hard to achieve. At the seventeenth International Congress for Pure and Applied Chemistry in Munich, the Dutch Professor, **A. E. van Arkel,** presented a noteworthy proposal. He reported that he had developed a heated wire process that represents a modification of the metal evaporation process. Through the heat of the hot wire a metal composition is decomposed, whereby free metal ions result. An electric field of stress drives these to an electrode, where they are deposited in pure and compact form. In this manner it is possible to achieve grade 3 purity of all metals with few exceptions.

* * *

Robert Gerwin, commenting upon this in VDI News (Sept. 26, 1959) writes, "This means that out of 1,000 metal atoms only a single foreign atom will be found. The average interval between two foreign atoms in the metal grid equals then about 10 lattice points. With the help of the zone melting process it is possible with repeated application to reach even the purity of grade 9 or 10.

Handbook on Aluminum Fastening

A new technical handbook, "Screw Fastening of Aluminum," has been added to the current series published by **Reynolds Metals Company.**

* * *

The new 48-page volume covers the various types of standard and special fasteners and fastening systems used to join aluminum assemblies.

The text is supplemented by 38 illustrations and 12 tables. It includes a list of manufacturers of special screw fasteners and recommended hole sizes for various types of self-tapping screws in sheet aluminum and other materials.

* * *

Other titles in the series, already published, are "Adhesive Bonding of Aluminum," "Riveting Aluminum," and "Mechanical Joining of Aluminum."

* * *

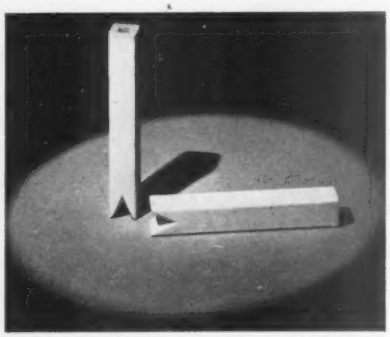
For your copy write to Reynolds Metals Company, PRD-32, Richmond 18, Va.

New Ceramic Wire Guide

American Lava Corporation, Chattanooga 5, Tenn., has announced an all-ceramic individual wire hold down guide for hot tin dipping. Outstanding features are: High resistance to heat, wear from abrasion and chemical attack.

* * *

The guide length (5 inches) obviates the need for corrosion-prone



Ceramic Wire Guides. * * * * * *

metals in close proximity to the tin pot.

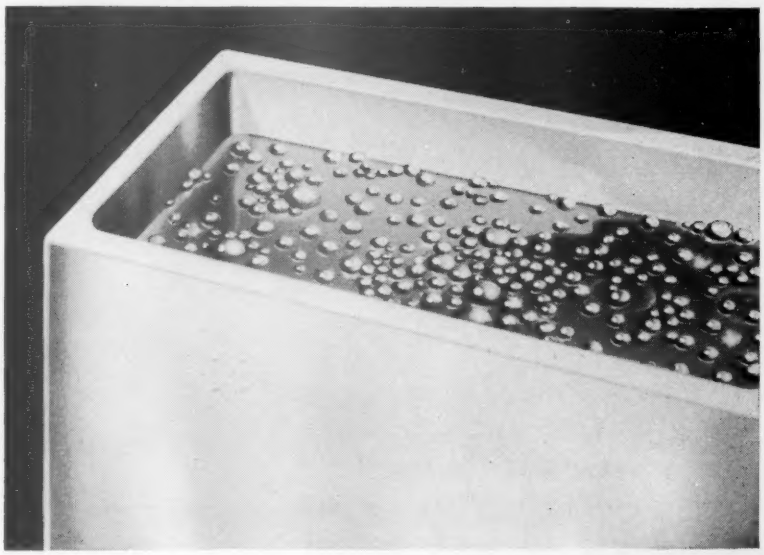
* * *

Actual mill tests have been in progress for over a year with no sign of wear or breakdown from corrosion to date. High savings in guide replacement, wire breakage and down time are claimed. Full information will be sent upon request.

New Line of S & C Machines Announced

The new Shuster IAVS Variable Speed Automatic Wire Straightening and cutting machine is an-

ACOUSTICA ULTRASONIC CLEANING REPLACES OLDER METHODS!



Texas Instruments, Martin Company, Bell Telephone Laboratories and many other firms are turning to Acoustica for better cleaning ultrasonically!

Now you can clean better and faster. In seconds—all dirt, dust, and soils are "cavitated" away ultrasonically. No scrubbing, no disassembling, maintenance costs are sharply reduced. Acoustica ultrasonic systems are application tested and **certified** for your particular needs. Send for details of complete Acoustica line of the most advanced ultrasonic equipment and cleaning chemicals. Acoustica Associates, Inc., Fairchild Court, Plainview, N. Y., 10400 Aviation Blvd., Los Angeles, Calif.

CERTIFIED APPLICATIONS

acoustica

ULTRASONIC CLEANING SYSTEMS

Your best buy...

124-INCH DIAMETER
50 TON CAPACITY
STEEL REEL
for oil filled cable

BETTER QUALITY
LONGER LASTING

NYECO

Steel Shipping Reels

ASSURE SAFE DELIVERY of your cable with rugged, weather resistant, splinter-proof NYECO steel reels. Protects costly cable against damage in shipping and processing due to dropping, bouncing, rough handling. Costs little more than wooden reels... lasts up to 10 times longer... requires minimum maintenance.

NYECO ALSO MANUFACTURES reels to United States Signal Corps., Bureau of Ships and other government agency specifications.

WHAT ARE YOUR REQUIREMENTS?

Send specifications for STEEL SHIPPING REELS, IMPREGNATING REELS, PROCESSING REELS, SUBMARINE CABLE REELS AND BRIDGE REELS. Prompt deliveries on large or small orders.

OTHER FINE NYECO PRODUCTS

- Impregnating Tanks
- Floor Rolls
- Vulcanizers
- Pressure Vessels

ANY QUANTITY — ANY SIZE — ANY FLANGE DIAMETER from 42" up

Specialists to the wire industries for over 50 years.

NEW YORK ENGINEERING COMPANY

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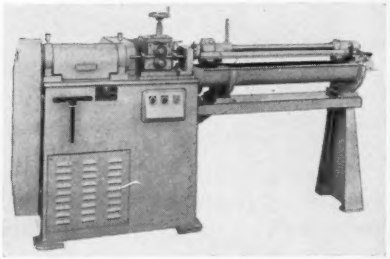
nounced by **Mettler Machine Tool, Inc.**, 155 Adeline St., New Haven, 4, Conn., for wire ranging in diameter from 1/16 to ¼ inch.

* * *

Features include straightening arbor of high speed type, with five elongated split-dies mounted on ball bearings; Reeves variable speed units for infinite feed ranges from 50 to 200 f.p.m.; feed roll housing totally enclosed with shafts mounted on Timken bearings; angled electric control panel



New Straightener and Cutter. * * * *

for one-position operation; Micro Switch trips new improved target with positive setting and positive release; Solenoid operated roll-type clutch; drive shaft mounted on ball bearings; fly wheel on roller bearings.

* * *

These machines are manufactured in 8 different standard models which include 3 models that are constant speed machines geared to feed up to 150 f.p.m., and 2 models especially designed for shaped stock. The latter are supplied with the Shuster 12 roll central foot shaped stock straightening unit in place of a rotary arbor.

* * *

Mettler Machine Tool, Inc., also manufacturers machines of this type for other applications, such as special speeds and capacities for heat treating, with feeds for press operations, etc. There are 51 Shuster models of wire straightening components and straightening and cutting machines from .020" to 11/16" capacities, as well as 4 models of the Shuster 5/16" cold thread rolling machine.

Our Advertisers are Reliable
Patronize Them

Outstanding Personalities of the Wire Industry

Dew Head Marks Anniversaries

George Loesch, Managing Director of one of Europe's largest specialty steel producers whose American Division is **Marathon Specialty Steels, Inc.,** 375 Park Ave., New York, marks the 40th year of his industrial career this year. The head of **Deutsche Edelstahlwerke AG** — internationally known as DEW — also celebrates his 60th birthday this month.

* * *

Mr. Loesch joined DEW in 1920 as Sales Manager of the export department at which time he began the marketing of specialty steels. Thereafter, he received successive appointments and responsibilities in DEW's multi-phased operations.

* * *

The greatest challenge of his career came during the period following World War II. In 1946, he became DEW's Assistant Managing Director and in the same year was named Chairman of the Executive Committee, placing under his direction all DEW's operations during a time when its main plant at Krefeld and the very existence of the company was seriously threatened by the dismantling of German industry.

George Loesch

* * *

Mr. Loesch's close cooperation with responsible authorities in Germany and elsewhere, particularly in the United States, are credited with keeping DEW intact. In recognition of his efforts towards furthering German-American cooperation, the Indiana Technical College of Fort Wayne,, Ind., granted him in May 1957 an honorary doctorate of laws. Under his guidance, DEW successfully completed the difficult task of rebuilding its facilities and raising operations to their present level.

Firth Sterling Appointments

Firth Sterling Inc. has announced personnel changes in the sales and sales promotion departments. **Thomas E. Pickering,** formerly manager, advertising and

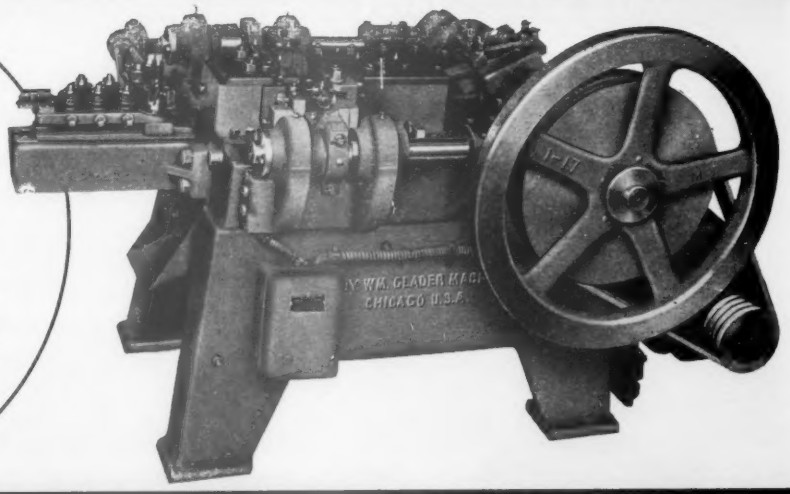
GLADER

HIGH SPEED WIRE NAIL MACHINES

HIGH TONNAGE OUTPUT — LOW MAINTENANCE COST

You can take care of increased production schedules and better product demands with these machines of established reputation.

For 55 years GLADER MACHINES have been giving HIGH QUALITY, LOW COST nail production.



Wm. Glader Machine Works 210 N. Racine Avenue Chicago 7, Illinois

Export Dept. 122 East 42nd Street -:- New York 17, N. Y.

sales promotion, has been appointed manager, commodity steel sales, to be responsible for national sales and distribution of the Company's line of tool bits, drill rod and ground flat stock. He has been with Firth Sterling for eight years.

* * *

J. Martin Stokes has been named manager of the newly created sales promotion department. He was formerly manager, sales administration. A veteran of thirty-two years with Firth Sterling, he will head up marketing, sales analysis and sales administration functions.

* * *

James W. Jordan has been named advertising and sales promotion assistant. He was formerly advertising assistant with Joy Manufacturing and is a graduate of Duquesne University.

Electric Wire Firm Appoints Executives

A. J. Sequeira, President of **U. S. Wire & Cable Corporation** has announced the appointment of **Richard A. Hyer** as Sales Manager and **Joseph V. Gallagher** as Production Superintendent.

* * *

Mr. Hyer, while with Federal Div. of I. T. T. for the past 17 years, was concerned with the many problems of sales and design of coaxial and special electronic cables.

* * *

Mr. Gallagher has been associated with the same division for 16 years and, as its Production Superintendent, was responsible for production and production control of wires and cables.

* * *

U. S. Wire & Cable, a leading manufacturer of many types of wires and cables, now is intensifying its production and research facilities for High Frequency Coaxial Cables and Cable Assemblies.

Joins Amchem Products

Dr. George C. Harrison, Jr., who resigned from the Pennsalt Chemicals Corporation, Philadelphia, shortly before the first of this year, has joined **Amchem Products, Inc.** Ambler, Pa., where he is specializing in protective coatings for steel in the Metalworking Chemicals Division.

* * *

Dr. Harrison was graduated from the University of Pittsburgh in 1951 with a degree in chemistry. He received his doctorate in Inorganic and Physical Chemistry from the same university in 1956.

Heads Research Center

Dr. Charles F. Eckert has been appointed manager of elastomer research at the Research Center of **United States Rubber Co.,** it was announced by **Dr. L. M. White,** the company's director of research and development. Dr. Eckert will start his new position on March 31 and will succeed **Dr. Marvin C. Brooks,** who has accepted a new assignment with the Tire division in Detroit.

* * *

In his new position Dr. Eckert

GREATER FLEXIBILITY IN WIRE STRAIGHTENING AND CUTTING WITH VARIABLE SPEED DRIVE

. . . in a low cost machine

- Select-O-Speed Drive permits selection of infinitely variable feed speeds from 25 to 155 FPM for all types of wire and rod.
- Available with super-sensitive electric trip mechanism.
- High-Speed Five-Die Straightener Arbor, mounted on ball bearings.
- Lewis engineered, simple, rigid, dependable . . . of best materials and workmanship.
- Ideal for manufacturers of stove and refrigerator racks, lamp shades, wire baskets, garment hangers, welding rod and other products where small diameter wire is used.

Lewis 1-C Automatic Wire Straightening and Cutting Machine. 1/16" to 1/8" capacity.

For further information write:

THE LEWIS MACHINE COMPANY

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will be responsible for directing fundamental research on new types of rubber and applied research on both existing and new types of rubber.

* * *

A graduate of Baker University, Baldwin, Kan., where he received his A. B. degree in 1938, Dr. Eckert received his Ph. D. degree from Northwestern University in 1942. He joined U. S. Rubber in the company's research and development department, then located in Passaic, in 1942.

Waterbury Farrel Elects Vice President

Dale Mitchell, President of the **Waterbury Farrell Foundry & Machine Co.,** Division of Textron Inc., has announced the appointment of **Arthur S. Nippes** as a Vice President.

* * *

Mr. Nippes was previously consultant to the President of Simonds Saw & Steel Company, Fitchburg, Mass., and Vice President and General Manager of Disston Division of H. K. Porter Co., Pittsburgh, Pa. He is a graduate of Pennsylvania State College in Mechanical Engineering, Class of 1940.

American Pulley Names Bain V.P. and G.M.

Charles E. Bain was elected to the post of vice president and general works manager at a recent meeting of the board of directors of **The American Pulley Co.,** Philadelphia, Pa. In these dual capacities, Bain will be responsible for all phases of product development, research, engineering and manufacturing.

* * *

He joined American Pulley in 1952 and has held the successive positions of manager of manufacturing, general works manager before this appointment, vice president and general works manager. After graduating from Miami University with a bachelor's degree in Industrial Engineering, he attended Harvard Graduate School and received a master's degree in Business Administration.

Directing G.E. Metal and Ceramic Research

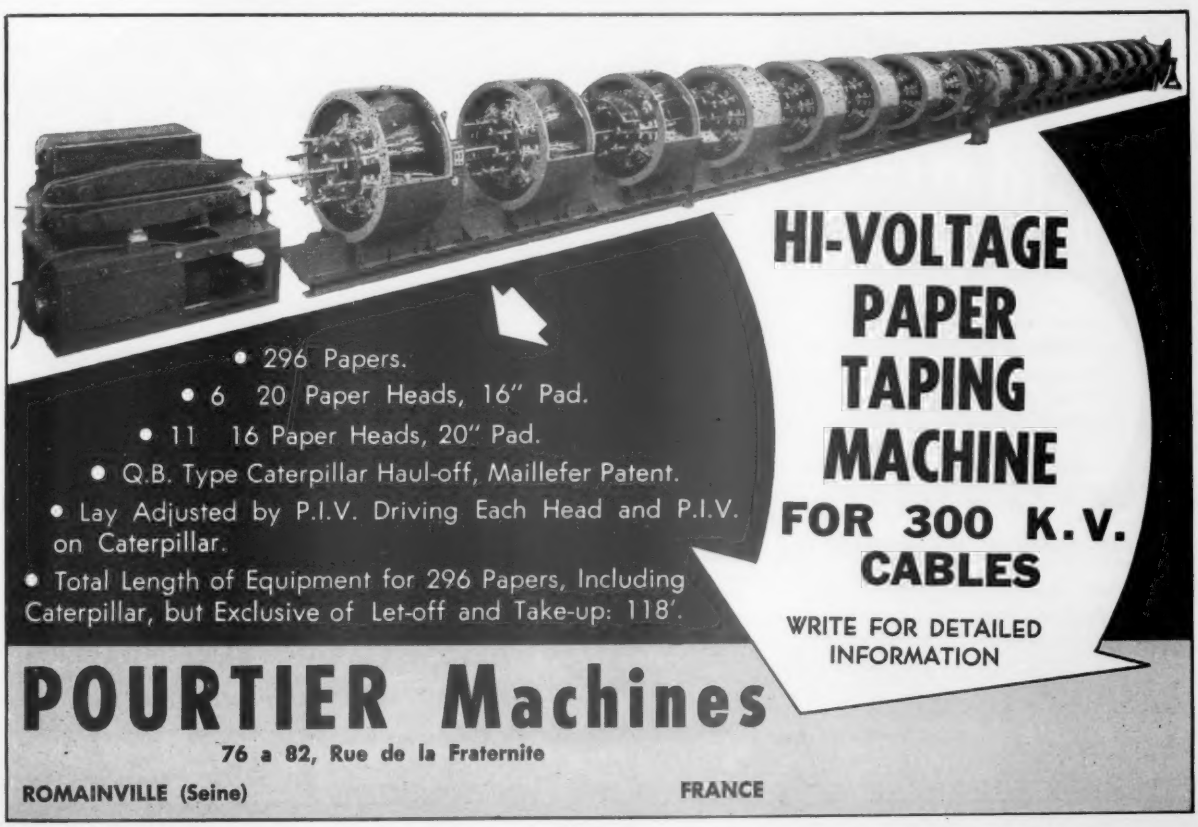
Dr. Walter R. Hibbard, Jr., has been appointed manager of the Metallurgy and Ceramics Research Department, **General Electric Research Laboratory,** it was announced by **Dr. Guy Suits,** General Electric vice president and director of research.

* * *

He will direct a professional staff of 136 scientists in various aspects of chemical metallurgy, physical metallurgy, alloy studies, ceramic studies, materials and process studies, and materials application and evaluation.

* * *

A native of Bridgeport, Conn., Dr. Hibbard received his A. B. degree from Wesleyan University, Middletown, Conn., and his Doctor of Engineering degree from Yale University.


• 296 Papers.
• 6 20 Paper Heads, 16" Pad.
• 11 16 Paper Heads, 20" Pad.
• Q.B. Type Caterpillar Haul-off, Maillefer Patent.
• Lay Adjusted by P.I.V. Driving Each Head and P.I.V. on Caterpillar.
• Total Length of Equipment for 296 Papers, Including Caterpillar, but Exclusive of Let-off and Take-up: 118'.
HI-VOLTAGE PAPER TAPING MACHINE
FOR 300 K.V. CABLES
WRITE FOR DETAILED INFORMATION
POURTIER Machines
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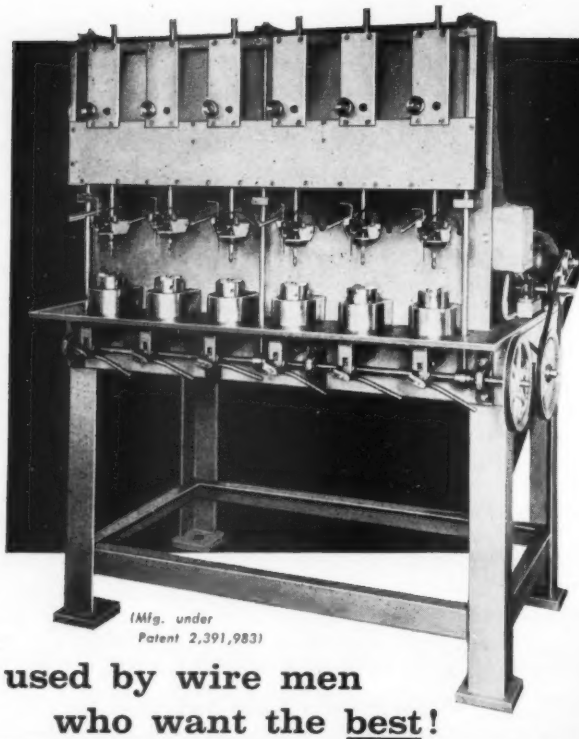
ROMAINVILLE (Seine)
FRANCE



(Mfg. under Patent 2,391,983)

used by wire men who want the best!

Sjogren AUTOMATIC DIE SIZERS

Another SJOGREN-BUILT Machine for "wire men who want the best!"

This Automatic Die Sizing Machine is available in 2 models — the Six Spindle (as shown) and the Single Spindle unit. Both models are identical in construction and the same production per spindle applies. Typical production per spindle, per hour, on the six spindle machine is:

2 dies at .165"	**8 dies at .082"**
4 dies at .135"	**10 dies at .072"**
6 dies at .095"	**15 dies at .062"**

(Total of 45 dies or more, per hour)

Sjogren engineers cordially invite wire men who are interested, to make a visit. If desired, a test run will be arranged, using their own dies, pins and compound.

Sjogren TOOL & MACHINE CO., INC.

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WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • GAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

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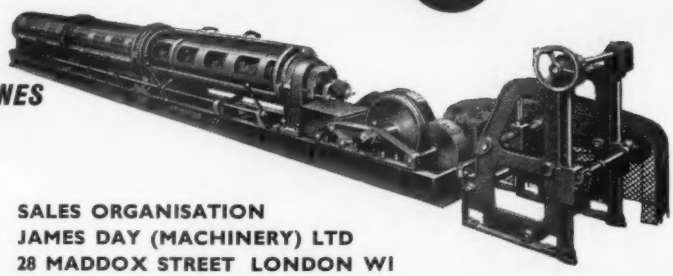
. . . indicate a world-wide reputation. Hanson & Edwards have supplied High Speed Tubular Stranding Machines to many of the most important Wire Rope and Cable factories throughout the world. These machines have rotors which run in large SPLIT ROLLER BEARINGS, not on support rollers, giving higher speeds, smoother running and lower maintenance costs

ROLLER BEARING TYPE HIGH SPEED TUBULAR STRANDING MACHINES

Made in various sizes for reels from 5"x 2½" up to 24"x 12" Write now for details



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P2035

To Represent Triangle In Houston Area

The appointment of **John F. McKiernan** as District Manager of the Houston territory for the **Triangle Conduit & Cable Co., Inc.** of New Brunswick, N. J., has been announced by E. J. Simmons, Director of Sales.

* * *

In his new capacity, Mr. McKiernan, formerly Application and Sales Engineer for the North Central District, will handle the sale of the company's electrical wire, cable and conduit products in this area.

Changes at Michigan Wire Cloth

Arthur A. Bull, Chairman of **Michigan Wire Cloth Co.,** Detroit, has reassumed his former post of president and chief executive officer. In order to lighten his operational responsibilities while recovering from an aircraft accident, Mr. Bull's son, **Arthur W.** was named chairman. **Alfred P. M. Cochrane,** formerly vice president, is executive vice president and continues as treasurer.

Ransohoff Adds to Sales Staff

William H. Young has been appointed to the sales staff of the **Ransohoff Company,** Hamilton, Ohio, manufacturers of equipment for metal surface processing, **R. C. Wigger,** Ransohoff Vice-President, announced recently.

* * *

Mr. Young has been associated with Ransohoff for twenty-two years, during which time he has been Office Manager, Ass't. Sales Manager, Chief Estimator, and for the last eight years, Plant Superintendent. He holds a Chemical Engineering degree from the University of Cincinnati.

New General Manager At National Electric

C. L. Holbert, President, **H. K. Porter Company, Inc.,** has announced the appointment of **Charles R. Billman** as General Manager of the Company's **National Electric Division,** which operates plants at Ambridge, Pa. and Elizabeth, N. J. National Electric manufactures wire, cable and electric wiring systems.

* * *

Mr. Billman has been most recently Assistant to the President, with special assignments including new plant construction, acquisitions, distribution and general management. He is a graduate of Penn State University with a degree of B.S.E.E., and Harvard Business School.

The 1960 BUYERS' GUIDE
Have you ordered your copy?
Price: $5.00

Three Wire Cloth Men Promoted

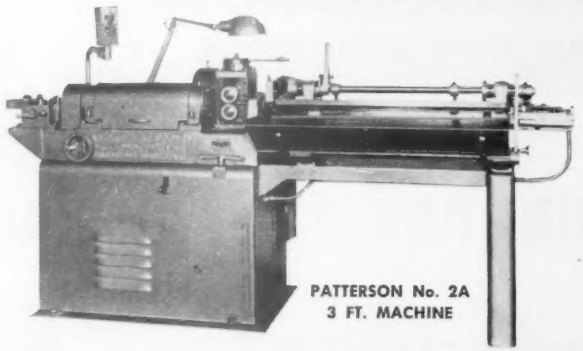
Promotion of three executives of the wire products division of **New York Wire Cloth Co.,** York, Pa., to new positions was announced recently by **Stuart M. Jones,** executive vice president.

* * *

G. F. Snyder has been appointed general manager—operations. Snyder has been serving as plant manager during the company's recent plant expansion program, which involved the installation of over a million dollars' worth of high-speed weaving equipment designed and developed by the com-

GEO. C. PATTERSON
HI-SPEED
AUTOMATIC WIRE STRAIGHTENING & CUT-OFF MACHINES

ELECTRICALLY OPERATED
with VARIABLE SPEED DRIVE



PATTERSON No. 2A
3 FT. MACHINE

We are proud to present this machine & 35 additional models to the mills and fabricators of wire, for we honestly believe they are top value in their field today. We have spared no expense to give you a precision machine tool that will give years of uninterrupted service. All iron castings are close grained Meehanite iron; cut-off and opener levers are high grade steel castings; all guides are hardened tool steel; electrical equipment is wired ready to run.

- MINIMUM COST
- MAXIMUM PRODUCTION
- ACCURATE LENGTHS
- NEW FEATURES

WRITE FOR FREE LITERATURE ON YOUR REQUIREMENTS

The GEO. C. PATTERSON Machine Company
3409 TRUMBULL ST. CLEVELAND 15, OHIO
PHONE: BRoadway 1-1808

pany's research division.

* * *

William F. Sewert has been named general sales manager, and will assume full responsibility of all sales and marketing activities. He has been serving as sales manager of this division for the past seven years.

* * *

Robert B. Wallace has been promoted to controller of the wire products division. He has been with the company's accounting department since 1931 and has served as assistant secretary of the company for the past 20 years.

Heads Stanley-Humason

Larned S. Whitney, Jr. was elected president and director of **Stanley-Humason, Inc.,** of Forestville, Conn., a subsidiary of The Stanley Works, New Britain, at a meeting of the Board of Directors. He has been vice president and general manager of the subsidiary since May, 1959.

Previously, Mr. Whitney was coordinator of hand tool plants outside New Britain, including the Atha plant of Newark, New Jersey, Stanley, Inc., of Pulaski, Tenn., and The Stanley Tool Company of Canada, Ltd., of which he is also a director. He joined Stanley Tools in 1946 and became a methods engineer. Later he managed the Ashfield plant, Ashfield, Mass., and in 1948 was made assistant divisional superintendent of Stanley Tools in New Britain.

Hertzog to Head Alpha Metals

The directors of **Alpha Metals, Inc.** have announced the election of **Harold Hertzog** as president. Mr. Hertzog moves up to the new post from his former position as vice president of the company. Since joining the firm in 1945,he has had wide experience in the field of metals marketing.

* * *

Martin A. Boyle, field sales manager since 1945, was named vice president in charge of sales, and Rena Shonberg was made secretary-treasurer.

Carbide Firm Adds Representative

The American Carbide Co., Union City, N. J., has announced the appointment of **Paul E. Dimling** as district sales engineer in the Detroit area, with headquarters at 14,910 Westwood Ave., Detroit 23, Mich.

* * *

The firm, an independent producer of carbide products, specializes in the fabrication of wire drawing and other dies, wear parts and inserts.

J. & L. Advances Two Men at Aliquippa

Frank S. Wilkins has been appointed Superintendent of the Rod and Wire Department at the Aliquippa Works of **Jones & Laughlin Steel Corp.,** according to an announcement by **A. C. Keller,** Works Manager. He was formerly Assistant Superintendent and suc-

EXECUTIVE REPORT #7

STRAIGHT-LINE DESCALING AUTOMATES WIRE AND BAR DRAWING LINES

Wheelabrator abrasive blast descaling brings new automation to wire products manufacture, with substantial savings in time and labor. Whereas batch pickling requires multiple handling operations, this mechanical descaling process involves handling coils only once or twice.

Rod can be straightened, cleaned, coated, drawn and cold headed in one continuous, straight-line operation. Single or multiple strands can be cleaned at speeds up to 600 fpm. The savings through eliminating acid pickling and multiple handling are enormous.

Take advantage of WHEELABRATOR'S engineering experience in wire descaling

Wheelabrator's unequalled experience in blast descaling of wire is at your service. Send for Bulletin 148-D illustrating the Wheelabrator automated wire drawing method. Wheelabrator Corp., 389 S. Byrkit St., Mishawaka, Ind. Canadian Division: P. O. Box 490, Scarborough, Ont.

ceeds the late **N. A. Hansen.**

* * *

R. A. Marks, formerly General Foreman, has been made Assistant Superintendent of the Rod and Wire Department. Mr. Wilkins has been with the Aliquippa Works for 30 years and Mr. Marks has been with the company for 24 years. The appointments became effective as of February 23, 1960.

Lane Joins Hubbard Spool

E. J. Hubbard, President of **Hubbard Spool Division,** The American Pulley Company, announces that **Harrison R. Lane** has joined the organization in the capacity of Executive Vice President, effective March 1, 1960.

* * *

Mr. Lane has a wide acquaintance throughout the wire and cable industry. He was formerly associated with Acrometal Products, Inc. as an official and Eastern Sales Manager. His wide experience in designing and engineering relating to the new packaging trends in the wire industry will serve to expand the manufacturing and diversification of products and customers' service of the Hubbard Spool Division.

* * *

Mr. Lane will make his headquarters in the Hubbard plant in Garrett, Indiana. Hubbard Spool now manufacturers the widest range of types and sizes of spools for the processing and shipping of wire and cable.

News From Atlas Steels

Effective February 1st, **James K. Kenyon** has been promoted from the position of General Foreman to that of Superintendent of the Cold Drawing Department of Atlas Steels Ltd., Welland, Ont., Canada.

* * *

James L. Gore, who formerly occupied this post, has become Technical Consultant, a position he will occupy until November 30, 1961, at which time he plans to retire. Mr. Gore is a long-standing member of The Wire Association.

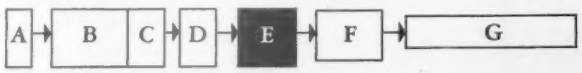
Volco Brass Appointments

Volco Brass & Copper Co., Kenilworth, N. J., has announced the appointment of **Joseph C. McCormack** as Executive Vice President; of **William V. Mernick** as Vice President in Charge of Sales; and of **Walter C. Drayton** as General Sales Manager. Mr. Drayton is also Vice President of the **New Jersey Rolling Mills,** a Volco subsidiary.

Correction

On page 60 of the January, 1960, issue, in **Mr. John Rigby's** introductory remarks to the presentation of his Mordica Memorial Lecture, he referred to **Mr. G. K. Rylands,** which was transcribed by the stenotypist as "Mr. Rattles." Our opologies to both Mr. Rigby and Mr. Rylands for the error in recording the name.

EXECUTIVE REPORT #8



ROD DESCALING, COATING AND DRAWING IN ONE CONTINUOUS OPERATION

at Lamson & Sessions Co.

In their new and ultra-modern Cleveland plant, Lamson & Sessions Co. has proved that Wheelabrator straight-line blast descaling is the shortest distance between hot rolled rod and wire profits.

Their automated descaling line starts with hot rolled rod on a payoff reel (A), provides a portable welding station (B) for joining successive coils, passes through a snarl switch (C) and straightener-leveler (D), through the Wheelabrator blast descaling cabinet (E), through coating and drying equipment (F) and to the draw block and re-coil unit (G) — all in a straight line, with no interruption and no intermediate handling.

This efficient method is made possible by the speed and thoroughness of Wheelabrator airless blast descaling, which removes all scale or rust down to virgin metal, without acid pickling, at speeds as dictated by subsequent operations.

WHEELABRATOR method lets you automate your wire and bar drawing lines

With the Wheelabrator method, you can blast clean in line with patenting, cold drawing and cold heading. To see how many leading producers are saving with this system, write for Bulletin 148-D. Wheelabrator Corp., 389 S. Byrkit St., Mishawaka, Ind. Canadian Division: P. O. Box 490, Scarborough, Ont.

A Review of Recent Wire Patents

The data listed below is only a brief review of recent patents pertinent to the readers and subscribers of this publication.

Complete copies of these patents may be obtained by writing to the publisher of this magazine and remitting 50c for each copy desired. For orders received from outside the United States the cost will be $1.00 per copy.

No. 2,923,039, TERMITE POISONING NAIL, patented February 2, 1960 by Robert E. Imus, Sierra Madre, Calif.

The nail is provided with a poison-carrying sleeve which, upon driving in the nail, moves longitudinally of the nail shank to expose the poison.

* * *

No. 2,923,186, NAIL FEEDING MECHANISM, patented February 2, 1960 by Herman V. Pierson, Joliet, Ill., assignor to United States Steel Corporation, a corporation of New Jersey.

This rotatable feeder mechanism includes a feeder having a number of notches around its periphery for receiving the shanks of successive blanks, a chute for feeding nail blanks with their heads upwardly into the notches, and a reciprocating pusher mounted for generally horizontal reciprocating movement in a direction to move a blank from one of the notches to the space between cooperating dies.

* * *

No. 2,923,484, COIL FORMING DEVICE, patented February 2, 1960 by George I. Roberts, Maywood, N. J., assignor to Bendix Aviation Corporation, Teterboro, N. J., a corporation of Delaware.

Guide members and pins carried by the device cooperate during the winding operation, one of the guide members cooperating with the pins so as to place wire of a coil winding on the parts of the body portions thereof between the end face of the core member and the inner sides of projections thereon, and another of the guide members cooperating with the pins of the group so as to place wire of another coil winding on the other parts of the body portions thereof at the outer sides of the projections so as to apply a number of coil windings to the core member.

* * *

No. 2,923,485, COIL WINDING APPARATUS, patented February 2, 1960 by William A. Fordeck, Garrett, Ind., assignor to The Magnavox Company, Fort Wayne, Ind., a corporation.

In this apparatus, the tension and position of the wire loop formed by the bobbin is controlled throughout each complete revolution of the bobbin, the movement of the loop as it is formed is utilized to register or count the coil turns as they are wound, even at high speeds.

* * *

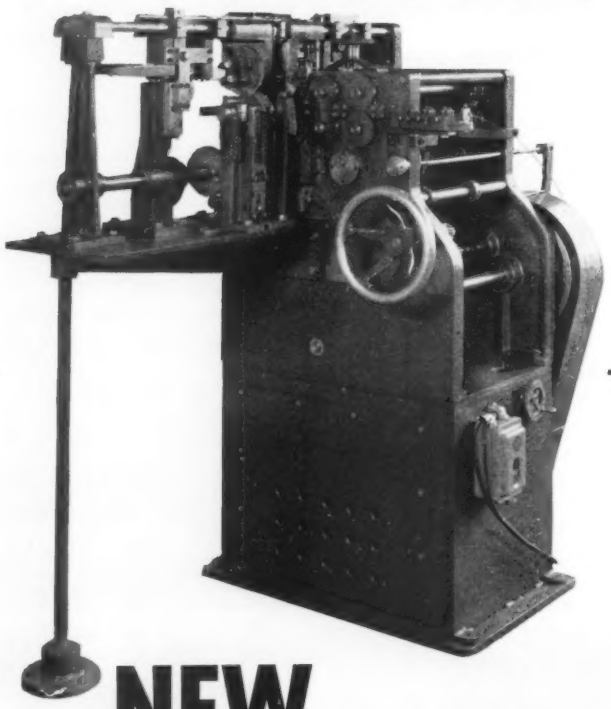
2,924,141, CABLE CONSTRUCTION, patented February 9, 1960 by Donald P. Kinniburgh, Seekonk, Mass., assignor, by mesne assignments, to The Crescent Company, Inc., Pawtucket, R. I., a corporation of Rhode Island.

A metallic shielding for flexible cables and the like is disclosed, having oppositely-disposed spiral windings, one of the windings comprising a metallic foil strip, and the other of the windings comprising a metallic filamentous strand, the windings being interlaced to form an interlocking braid.

* * *

No. 2,924,329, WIRE FINISHING DEVICE, patented February 9, 1960 by Howard W. Compson, Snyder, N. Y., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

In this wire finishing device for wire drawing machines, there is provided a die retainer for supporting a finish die in the path of the wire, having lateral die-face engaging surfaces, a central recessed portion between the surfaces defining a passage across one end of the die for receiving flooding compound for cooling the face of the die and cleaning the wire leaving the die.



NEW For Springmakers

AUTOMATIC COILER and LOOPER

WELLS' NEW FULLY AUTOMATIC SPRING COILING AND LOOPING MACHINE coils, trims and loops in sequence. By trimming before looping extremely accurate springs are made. Produces cross-over, machine and side loops, or any combination of these.

Machine shown above handles .025" to .062" diameter wire, forming coils of 3/16" o.d. to 5/8" o.d., 1/2" to 5" long.

Loops on each end can be varied 360° to each other and held to ±3°. Loop openings can be held to ±.010", or less.

Adapted from the WELLS large diameter automatic coiling and looping machines made for several years, this new spring machine will be a boom to manufacturers of mechanical coil springs.

Made By The Producers of the Wells Straightening And Cutting Machines.

Write for information

Frank L. Wells Company

BUILDERS OF FINE WIREWORKING MACHINERY

5821 FIFTH AVENUE • KENOSHA, WISCONSIN

QR — HARVEY SPRING MFG. CO. — 671 N. Sangamon St., Chicago, Ill.

No. 2,924,448, COILED SPRING STRUCTURE, patented February 9, 1960 by Dean L. Nantz, Greenwood, S. C., assignor to Wonder Products Company, Collierville, Tenn., a corporation of Tennessee.

A hook is provided at one end of the spring structure for connection with a load, while a secondary hook is readily detachable or attached to the end of the spring.

* * *

No. 2,924,536, PROCESS FOR TREATING WIRE SCREEN, patented February 9, 1960 by Thurmon L. Collins, Laurel, Miss., assignor to Masonite Corporation, Laurel, Miss., a corporation of Delaware.

A method of increasing the thickness of press wire screen adapted to transfer heat uniformly over a predetermined area wherein the increased thickness gradually decreases from the outer screen edge inwardly toward the center, is disclosed and comprises spraying the wire screen with molten metal to increase the thickness of the edge portions thereof about 20-25 mils over an area comprising a series of longitudinal strips about 3.5-4 inches wide in several discrete layers, each of which is about 3-4 mils thick.

* * *

No. Re. 24,785, COLLAPSIBLE BOTTLE CARRIER, patented February 16, 1960 by Llewellyn Jones, Southgate, Calif., assignor to Strongcraft Products, Inc., Los Angeles, Calif., a corporation of California.

A wire carrier for a number of bottles is provided with bottom, top, handle and connecting portions between the top and bottom of wire strands.

* * *

No. 2,925,099, SPRING UNIT LACING MACHINE, patented February 16, 1960 by Victor J. Bergstrom, Chicago, Ill., assignor to Johnson Spring Cushion Company, Chicago, Ill., a corporation of Illinois.

There are seventeen claims to this machine for lacing together core springs into a spring unit.

* * *

No. 2,925,115, SPRING COILING MACHINE WITH MEANS FOR PERMITTING REMOVAL OF TERMINAL PORTION OF WIRE, patented February 16, 1960 by Edward E. Franks, Jr., Litchfield, Conn., assignor to The Torrington Manufacturing Company, Torrington, Conn., a corporation of Connecticut.

A cyclically-operated spring coiling machine is disclosed having a wire removing device so that a terminal wire piece which remains after main wire cutting and has its trailing end at the feed rolls of the machine, and which is bent partly around the arbor, may be readily removed in the leading direction through a bracket aperture.

* * *

No. 2,925,170, WIRE FEEDER, patented February 16, 1960 by Howard G. Rath, Fanwood, and Alfred J. Miller, Westfield, N. J. and John A. Kratz, Bronxville, N. Y., assignors to Union Carbide Corporation, a corporation of New York.

The feeder is motor driven operatively connected with a wire feed roll and a gear reduction unit. There are wire guide back-up roll yieldably mounted on an accessory support bracket and journaled eccentric to the feed roll shaft, and means mounted on the bracket for urging the back-up roll toward the wire feed roll, and means for adjusting the accessory support bracket about the axis of the feed roll shaft to a selected angle of wire feed in a plane radial to the feed roll shaft.

* * *

No. 2,925,855, SPRING ELEMENT FOR CUSHION SPRING STRUCTURE, patented February 23, 1960 by John M. Caughey, Adrian, Mich., assignor to Stubnitz Green Corporation, Adrian, Mich., a corporation of Michigan.

There are provided a main bridging portion of wire having terminal supporting ends, at least one of the ends being in the form of a fish mouth and having a first transverse torsion bar portion immediately adjacent one end to which the top border frame of the spring cushion construction is adapted to be attached, a first side sloping inwardly from the first bar to define a part of the fish mouth form, a second transverse torsion bar in spaced relation to the first bar, a second side angularly disposed to the side and oppositely directed to define another part of the fish mouth form and terminating in an attachment foot portion, these bars and sides being integral extensions of each other and collectively defining a common convolution formed by a series of similarly directed bends.

Another Development ... by Hubbard!

PLYWOOD MARRIES STEEL

FOR BETTER SHOP REELS

RESULTING IN

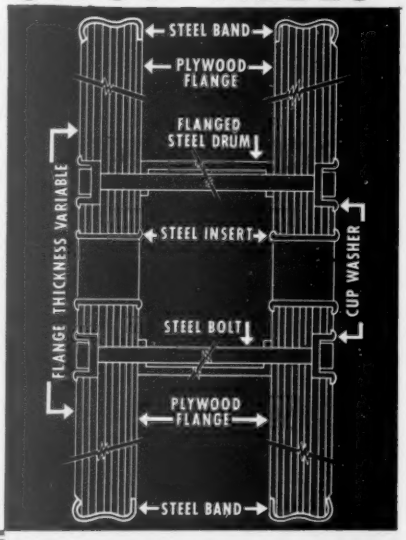
1 GREATER IMPACT STRENGTH

2 LOWER MAINTENANCE COSTS

3 LIGHTER WEIGHT FOR EASIER HANDLING

4 CAN BE SUBMERGED IN WATER

5 WIDE RANGE OF SIZES



LOWER INITIAL COST

FOR DETAILS CONTACT

HUBBARD SPOOL DIVISION

The American Pulley Company

GARRETT, INDIANA

The West Coast Regional Meeting of . . .

THE WIRE ASSOCIATION

JUNE 9-10, 1960 — STATLER-HILTON HOTEL — LOS ANGELES, CALIFORNIA

TENTATIVE PROGRAM

THURSDAY, JUNE 9th

10:00 A.M.-2:00 P.M. — Registration.

10:30 A.M. — Meeting of the Association's Board of Directors.

2:00 P.M. — Technical Session and Film.

FRIDAY JUNE 10th

10:00 A.M. — Plant visit to American Brass Co.

12:30 P.M. — Luncheon.

1:30 P.M. — Plant visit to K. H. Davis Wire and Cable Corp.

6:30-7:30 P.M. — Cocktail Hour and Entertainment.

7:30 P.M. — Dinner. Door prizes given. After dinner speaker. Ladies invited to attend.

A fine program and a good time is assured to those who attend. All wire men invited.

Full details will be published next month.

THE WIRE ASSOCIATION

RICHARD E. BROWN, Executive Secretary

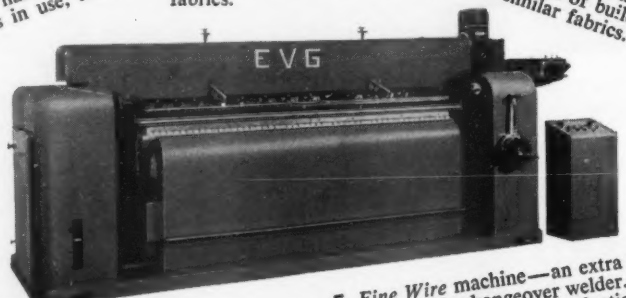
453 MAIN STREET **STAMFORD, CONN.**

EVG COVERS THE WHOLE FIELD OF WELDED WIRE FABRIC

1. *Heavy Duty* model G 6—designed to handle the heaviest meshes in use, i.e. pipe mesh.

2. *Standard Duty*—handles all constructions specified by engineers for reinforcing road fabrics.

3. *Medium Duty*—a specialized machine for the low-cost production of building mesh and similar fabrics.



4. *Light Wire* machine—a high precision welder, specifically designed for the production of visual type fabrics; fencing, mink batteries, etc.

5. *Fine Wire* machine—an extra high speed, flexible changeover welder. Particularly suited to the production of welded hardware cloth in all gauges and spacings.

COMPLETE LINE OF FULLY AUTOMATIC WELDING EQUIPMENT

Please direct inquiries to: **Richard E. Kleinhans** U.S.-Canadian Representative 122 East 42nd St., New York 17, N.Y. OXford 7-0770

You Are Cordially Invited to Attend

THE SPRING REGIONAL MEETING
of
THE ELECTRIC WIRE & CABLE SECTION
THE WIRE ASSOCIATION

MAY 4 & 5, 1960 — SHERATON HOTEL — PHILADELPHIA, PA.

PROGRAM SCHEDULE

WEDNESDAY MORNING — MAY 4TH

9:00 A.M. — Registration of Members, Guests and Ladies
10:00 A.M. — Electric Wire & Cable Committee Meeting (Connie Mack Room)
10:30 A.M. — Ladies' Coffee Hour
12:00 Noon — Committee Luncheon for Program Participants (Constitution Room)

WEDNESDAY AFTERNOON — MAY 4TH

1:45 P.M. — Welcome by Allan B. Dove, Association President (Pennsylvania Room)
2:00 P.M. — Technical Session (Pennsylvania Room)
6:00-7:00 P.M. — Hospitality Hour — Ladies are invited (Constitution Room)

—————o—————

THURSDAY MORNING — MAY 5TH

9:00 A.M. — Technical Session (Pennsylvania Room)
10:00 A.M. — Ladies leave for tour of Longwood Gardens, with luncheon at the du Pont Country Club, Wilmington, Del., returning to the hotel at approximately 2:30 P.M.

THURSDAY AFTERNOON — MAY 5TH

1:00 P.M. — Visit to the Copper, Tubing and Conduit Divisions of Walker Brothers in Conshohocken, Pa. Transportation will be by bus only. Busses will return to the hotel by approximately 4:30 P.M. Late check-out, 7:00 P.M., has been arranged with the hotel for all attending the Regional Meeting.

DETAILED PROGRAM WILL BE MAILED TO MEMBERS.

Association members will receive hotel reservation cards by mail.
Others desiring to attend may write for them.

THE WIRE ASSOCIATION

RICHARD E. BROWN, Executive Secretary

453 MAIN STREET **STAMFORD, CONN.**

New Machine Layer-Winds Square Or Rectangular Wire At High Speeds

Slow, laborious winding of flat or square wire under manual guidance appears to be a thing of the past if mill-run tests of a new automatic Acropak Layer-Winder are half as good as current engineering studies report.

* * *

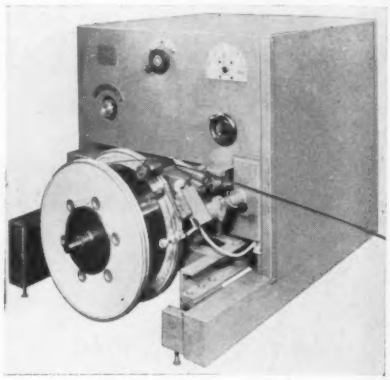
This problem has plagued wire mills for years, not only because of the time involved but because it tied up one man per reel to control and guide the feed by hand.

* * *

Acrometal's new Layer-Winder, a product of Acrometal's burgeoning research and development department, does this work automatically at speeds as fast as 1,000 feet per minute. Special tension guides lay the wire snug and even without overlaps or gaps.

* * *

The saving in labor is even more dramatic. In several mill-run tests, one machine has been known to turn out as much work as 4 men using conventional methods. Production models of the machine



Acropak Portable Accumulator for Layer Winding.

have been in use for six months in several wire mills around the country where the reports have been uniformly favorable.

* * *

Fred Bieber, president of **Acrometal Products, Inc.,** Minneapolis, states that the company is already fully tooled and has the machine currently in production. Acropak is the trade name for Acrometal's reels, spools and machines widely used in the wire industry.

Electrical Insulating Materials

Bulletin GET-2929A, 12 pages, describes in text, tables, and illustrations the characteristics and applications of General Electric's complete line of insulating materials for electrical equipment. Publication provides technical data and suggested uses of available products including mica mat, built-up mica, coated materials, varnishes, paints, adhesives, compounds, thinners, irradiated materials, wire enamels, and permafils. It also includes ordering information and list of regional sales offices. For a copy, write **General Electric Company,** Schenectady 5, N. Y.

New "Sure-Flex" Coupling Bulletin

Wood's Bulletin No. 5103 (revised) covers the complete line of "Sure-Flex" flexible couplings, in-

The PESCHEL line

ELECTRICAL TEST EQUIPMENT FOR THE Wire Industry

Low Cost-High Quality Sparker

Now- GUARANTEED FOR 5 YEARS

Model S14CV — AC/DC

FEATURES: RUGGED CONSTRUCTION WITH LONG LIFE SELENIUM RECTIFIERS • ACCURATE AT ANY SPEED • DC OR AC OUTPUT • FOR USE ON EXTRUDER OR RESPOOLER. ANY SPEED • 400 FPM WITH 1" ELECTRODE (2400 FPM WITH 6" ELECTRODE) • RELIABLE OPERATION DOWN TO 5% OF MAXIMUM OUTPUT VOLTAGE • SIMPLE TO OPERATE BY INEXPERIENCED PERSONNEL.

FOR BEST VALUE — SPECIFY PESCHEL SPARKERS

PE PESCHEL ELECTRONICS, INC.

TOWNERS, NEW YORK (Putnam County) Tel: TRinity 8-3251

cluding the new "Junior" coupling with flanges of zinc alloy AG40A and the large-size bushed couplings fitted with "Sure-Grip" interchangeable, QD-type tapered bushings. New engineering data is also given on spacer couplings with drop-center sleeves and on the use of "Sure-Flex" couplings with a floating shaft to connect two shafts that cannot be brought close enough together to be connected by a single coupling. Two colors, letterhead size, 10 pages. For a copy, write **T. B. Wood's Sons Co.**, Chambersburg, Pa.

You Are Invited To Join

THE WIRE ASSOCIATION

Send for booklet describing its activities and a membership application card.

453 Main St. Stamford, Conn.

Practical Establishment of Rectangular Wire Enameling Speeds

(*Continued from page 462*)

From these results Figures 3 and 4 are drawn as shown.

Extensions of Basic Formula

A. Capacity determination for an enameling head:

The weight of wire produced by an enameling head in a 24 hour period is given as the product of speed, wire cross section, conductor density, and time. Therefore if a wire of dimension W mils x T mils is run for 24 hours on an enameling head, the capactiy is found by the following relationship:

$$V = WTS\rho C \quad \text{..... 12}$$

where C is a units conversion factor:

Substituting:

$$S = K\left(\frac{1}{W}+\frac{1}{T}\right) \quad \text{..... 1a}$$

We obtain:

$$V = WTK\left(\frac{1}{W}+\frac{1}{T}\right)\rho\ .10^{-5} \quad \text{.... 12a}$$

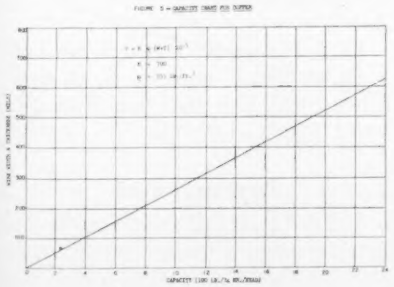
or:

$$V = K\,(W+T)\,\rho\ .10^{-5} \quad \text{..... 12b}$$

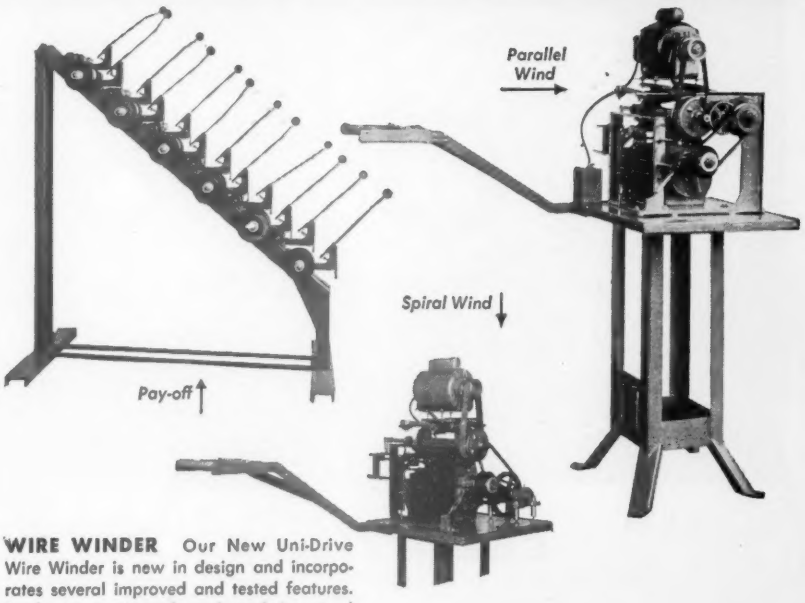
Equation 12b is plotted on linear graph paper as (W + T) vs capacity (1b/24 hr./head) in Figure 5 for wire run at the speeds determined from Figures 3 or 4.

* * *

B. Dimensions of slowest running wire of given cross section: In designing an enameling oven, the designer is usually limited both by the minimum desirable speed and by the total cross section of wire being run. Often the two limits are thought to be independent, but this is not so as shown below.



STANDARD UNI-DRIVE WIRE WINDER



WIRE WINDER Our New Uni-Drive Wire Winder is new in design and incorporates several improved and tested features. Production is stepped up through increased speed. It produces smooth, even and accurately wound spools of wire in single or multiple ends. All strands parallel — no over or under-winding. Can also be furnished with a slight spiral pattern for winding exceedingly fine wire. Automatic Stop Motion controls each strand. Traverse adjustable from 1¾" to 5½" between spool heads without changing cam. Designed especially for winding wire to be braided and shielded for electrical conductors.

Various types of supply packages that may be wound on Standard Uni-Drive Wire Winder.

PAY-OFF Our Pay-off Attachment consists of a heavy fabricated frame on which Pay-off spools are mounted to cover desired number of ends to be wound. Equipped with spindles, running on self-aligning ball bearings, with size of spindles and adapters to accommodate customers' pay-off spool. Compensating Attachment to control the tension of each individual strand of wire, applying the same tension when spool is full as when empty. Can also be adapted for use with bunching machines.

STANDARD MILL SUPPLY COMPANY
31 ESTEN AVENUE PAWTUCKET, R. I., U. S. A.

If a wire cross section is given equal to A, then:

* * *

$$WT = A \quad \text{..... 13}$$

$$\text{or } W = A/T \quad \text{..... 13a}$$

* * *

From Equation 1:

$$S = K\left(\frac{1}{T} + \frac{1}{W}\right)$$

* * *

Substituting:

$$S = K\left(\frac{1}{T} + \frac{1}{A/T}\right) = K\left(\frac{1}{T} + \frac{T}{A}\right) \quad \text{..... 14}$$

* * *

For minimum speed differentiate S with respect to T and set $\frac{dS}{dT} = 0$ This gives:

$$\frac{dS}{dT} = 0 = K\left(-\frac{1}{T^2} + \frac{1}{A}\right) \quad \text{..... 15}$$

$$\text{and } \frac{1}{T^2} = \frac{1}{A}$$

$$\text{or } T = \sqrt{A} \quad \text{..... 16}$$

* * *

Similarly it may be shown that

$$W = \sqrt{A} \text{ at } \frac{dS}{dW} = 0 \quad \text{..... 16a}$$

* * *

Therefore a square wire runs at minimum speed for a given cross-section. Ovens should be designed to take this into account, as it is a basic relation in the operation of the equipment.

Summary

In conclusion, the following concepts and resultant operating procedures have been presented:

A. Rectangular wire enameling speed is governed by the equation:

$$S = K\left(\frac{1}{W} + \frac{1}{T}\right)$$

* * *

Both experience and theory show this relationship to be accurate.

B. The speed equation consists of two coincident hyperbolas when plotted from the form:

$$S = S_w + S_t = \frac{K}{W} \quad \frac{K}{T}$$

One hyperbola correlates a speed component to wire width, the other correlates a speed component to wire thickness. The sum of the components yields the total wire speed.

* * *

C. Since a plot of log wire dimension vs log speed plots as a straight line, a valid speed chart over the full wire size range may be drawn by actually running only three wires of dimensions a x b, b x c, and a x c. Solution of the three resulting equations:

$$S_a + S_b = p$$
$$S_b + S_c = q$$
$$S_a + S_c = r$$

gives three points which completely establish the entire speed curve.

* * *

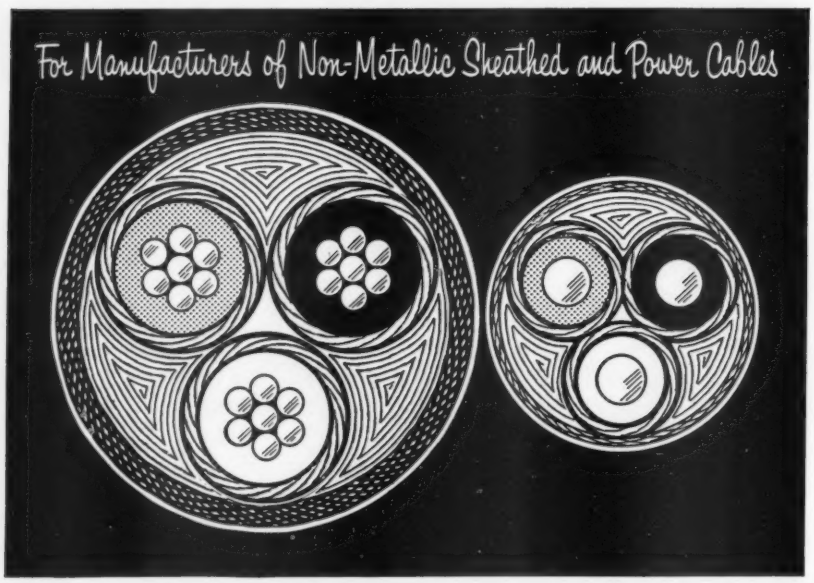
D. Although direct solution of the speed equation will yield a K value, this procedure is not recommended. The three equation system provides an automatic check, and this is well worth the small additional work required.

* * *

E. Further useful operating data, such as oven capacity and speed limitations are derived from the basic speed equation.

Nomenclature

Units of terms are listed in the general form. Except where specific constants are mentioned, any



CABLE FILLER

. . . Engineered To the Job

Name your cable filler. Plymkraft will fill the bill: lightly waxed, heavily waxed or cold wax cable fillers. Wax type is picked to meet your design requirements on moisture resistance, tensile strength, footage and fill capacity.

Pick your putup—up to 12" x 12" tubes—for the most efficient production run. Uniformly treated and twisted Plymkraft fillers come in a wide range from .030" x 7/32" in diameter.

Your Plymouth man can help you choose the cable filler which best meets your requirements and is the most economical and cleanest for your operation. Engineering consultation available for specific problems. Write or call any sales office below.

296 State St. Boston, Mass. CApital 7-1134
323 West Polk St. Chicago, Ill. HArrison 7-6238
366 Madison Ave. New York, N. Y. YUkon 6-9230
P.O. Box 10215 New Orleans, La. VErnon 5-7243
70 Sacramento St. San Francisco, Calif. GArfield 1-4709
750 Bay St. Toronto, Ont., Canada EMpire 3-4281

PLYMKRAFT DIVISION
Plymouth Cordage Company, Plymouth, Massachusetts

Nomenclature

Sign		Definition	Units
A	=	cross-section area of wire	L^2
a & b	=	constants	
c_p	=	heat capacity of a solid	Q/MT
D_f	=	thermal diffusivity $\left(= \frac{k}{\rho\, c_p} \right)$	L^2/θ
d	=	sign of the calculus meaning derivative	
h	=	height of a cross-sectional area of wire	L
k	=	thermal conductivity	$Q/LT\theta$
K_w & K_t	=	unknown constants of Burns' & Swartfiguer's Equations	
K	=	overall heat transfer coefficient and units conversion factor	
L	=	thickness of material through which heat flows	L
Q	=	quantity of heat flow	Q
q	=	$\triangle Q/\triangle O$ = quantity of heat per unit time	$\frac{Q}{\theta}$
S	=	wire speed (ft./min.)	L/θ
T	=	wire width (mils)	L
W	=	wire thickness (mils)	L
w	=	wire weight	M
V	=	wire volume	L^3
t	=	temperature	T
α	=	sign of proportionality	
prefix $\triangle$	=	incremental change i.e. $\triangle\theta$ = change in time	
ρ	=	density of conductor	M/L^3
θ	=	time	θ
$\triangle x/\triangle y$	=	rate of change of quantity X with respect to change of quantity Y.	

consistent system of units may be used in the equations given.

M = weight
L = length
θ = time
T = temperature
Q = heat

References

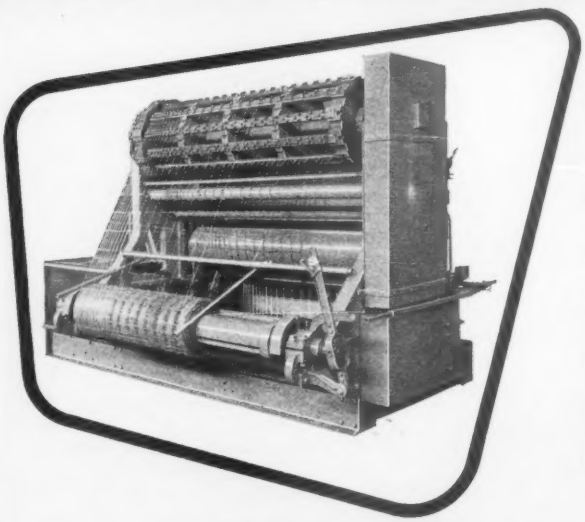
(1) Private letters:
A. C. Dastoli, General Electric Company, Pittsfield, Massachusetts to R. L. Graves, General Electric Company, Pittsfield, Massachusetts, November 25, 1953 and January 29, 1954.

(2) "Rectangular Wire Enameling Speeds"
C. V. Burns and H. C. Swartfiguer General Electric Company unpublished report — July 1956

(3) *Chemical Engineers' Handbook* — 3rd edition
J. H. Perry, Editor, McGraw Hill Book Company, Inc., 1950

(4) *Chemical Engineering*, Vol. 1, McGraw Hill Book Co., Inc., January, 1955
J. Coulsen and J. Richardson Pg. 157-160

Interlocking FENCE LOOMS



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SPECIALISTS IN FENCE LOOMS

The Control of Eccentricity in Electrical Cables

(*Continued from page* 458)

building block system is best illustrated by some examples of the hundreds of different possible combinations afforded by this system. Fig. 3 shows the instrument console of a small extrusion control station incorporating eccentricity monitoring and optical size control equipment. Fig. 4 shows diagramatically a comprehensive up-to-date control station for cellular polythene extrusions.

* * *

An interesting point concerning the application of the capacitive eccentricity gauge to cellular materials is the consideration that in this type of extrusion the geometric centre may not coincide with the capacitive centre. As the electrical properties, such as cross talk, are dependent on the latter rather than the former property of the cable it would seem an advantage to employ a capacitive rather than an inductive type of gauge.

* * *

The use of strip chart recorder units in conjunction with eccentricity monitoring equipment almost invariably reveal interesting information. The analysis of the recordings, and comparison of the

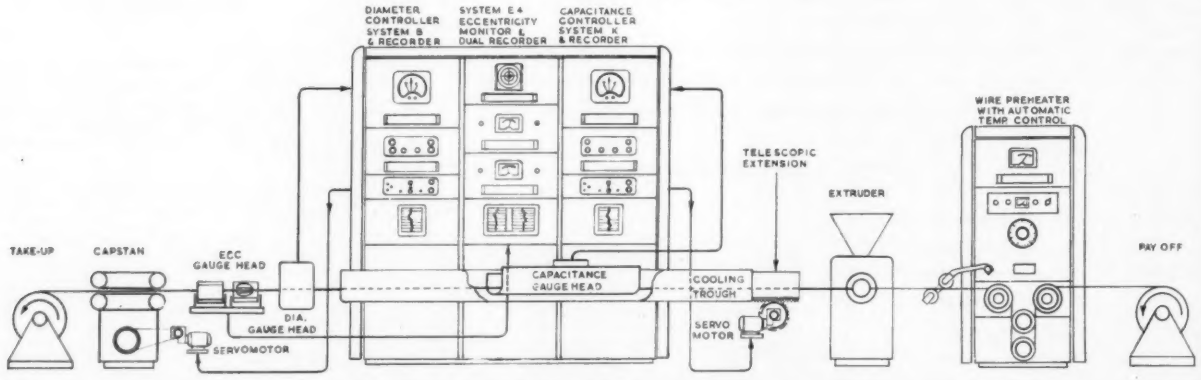

Figure 4 — Comprehensive Extrusion Control Lay-out for cellular polythene extrusions, incorporating eccentricity monitoring, capacitance and size control equipment, as well as 3 strip chart recorders. By courtesy of Reliance Cords & Cables Ltd.

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repetition rates of errors with frequencies in the manufacturing process, such as heat control cycles, pay-off-, screw-, capstan-, and take-up speeds, frequently give clues as to the causes of eccentricities. By way of example two recordings are reproduced in Fig. 5. These demonstrate possible errors during production runs of a 35 KV polyethylene power cable. The small periodic variation in the first graph can be traced by its time period to an unevenly running supply drum; the irregularity apparent in the second diagram is due to the effect of "birdcageing" of the multiple conductors forming the core of the cable.

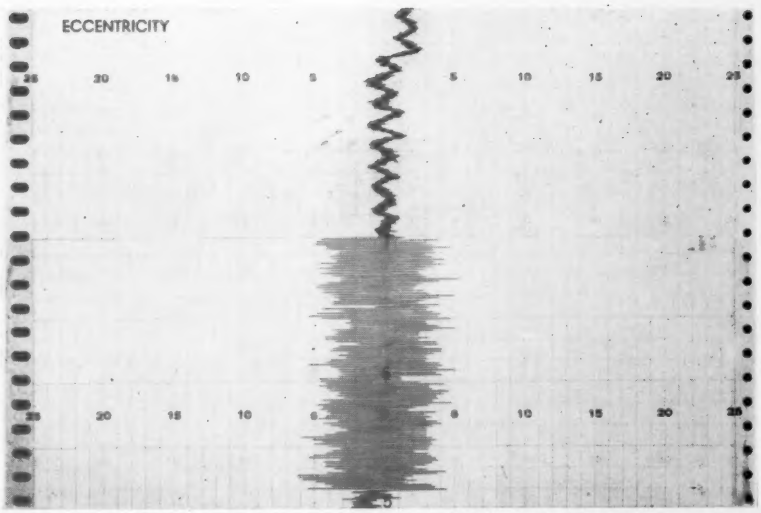

Figure 5 — Eccentricity Recordings. By courtesy of Simplex Wire & Cable Co.

Automatic Control

As apparent from earlier remarks, the present system of eccentricity monitoring can be applied to, and affords all the necessary building blocks for the automation of an extruder to maintain center automatically. It has been successfully used in this way in a number of installations.

* * *

Since the correction of eccentricity is invariably associated with two coordinates, it is convenient, and economical, to derive the two error signals from the already resolved components of the gauge, and feed these via two servomotors to the screw adjustments of the die. The counter screws in both planes are replaced by restoring springs, and carefully ground and polished surfaces will ensure adequate freedom of movement of the die in spite of the pressure exerted by the plastic material.

* * *

Alternatively, the two servomotors can be arranged to act on a positioning device for the core tube — or a movable roller support for the extruded cable, varying the

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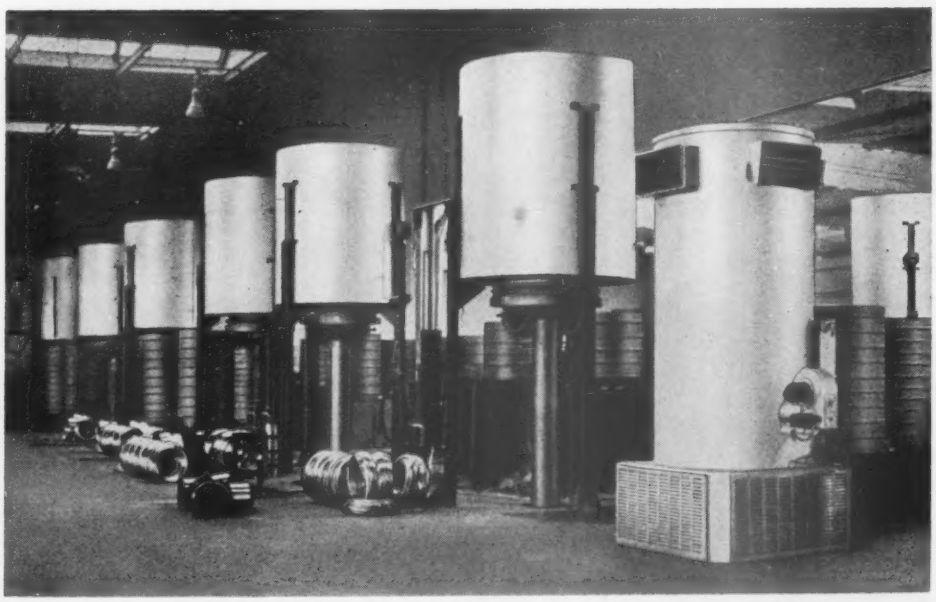

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angle of exit of the cable from the extruder.

* * *

An alternative method of adjustment of the die consists of mounting the latter within two eccentrics. This arrangement is in effect identical to a slide, but requires somewhat more torque, as here the equivalent to a number of turns of the adjusting screw is one half turn of one eccentric.

* * *

Other possibilities of automation which suggest themselves are the control of temperature zones around the die box which would have the disadvantage of slow response, or the control of pressure zones by means of valves. This latter method has not as yet been put to trial.

Non Contacting Eccentricity Monitors

Having reviewed the present stand of the technique, it may be of some interest to look at the future trends of development in this field. While the existing gauges are fully adequate in their performance, their application is limited to measuring positions at the end of the cooling trough, or at the best, about half way towards the extruder. This results in two drawbacks: with wires and thin cables a certain degree of twist may be present between the extruder die and the measuring position. This renders automatic control unpracticable. In heavier cables which are extruded at a slower rate, the detection of eccentricity is delayed by the travelling time of the cable. This entails delays and possibly losses in correcting errors, especially when starting up an extruder line.

* * *

These difficulties have now been overcome by the development of a non-contacting eccentricity monitor, which can be placed immediately behind the extruder, or early on inside the cooling trough. Experimental work on both these types of gauges has been going on for a considerable time and trials with prototype gauges are now in progress.

The non-contacting gauge is based in principle on a combination of an Eccentricity Monitor as shown in Fig. 2 with an Addison optical diameter gauge (Patents applied for). The latter represents the first non-contacting optical gauge on the market, using a scanning method and dispensing with cable guides. It is employed in the new eccentricity monitor to position the eccentricity sensing probes at an accurately determined distance away from the cable surface.

* * *

This is achieved by feeding the output voltage from the photoelectric diameter gauge to a solenoid. The latter actuates an armature which carries the eccentricity sensing element, and at the same time acts as a light shutter. The whole system is balanced by the use of a comparative light beam, and it is arranged to be null-seek-

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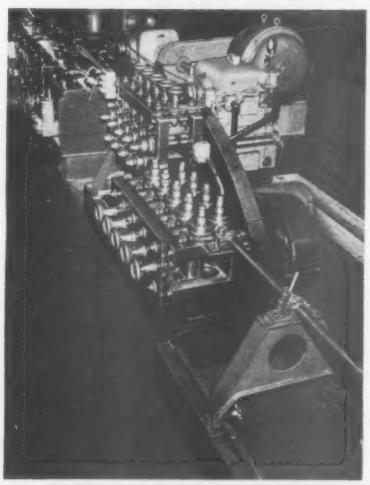
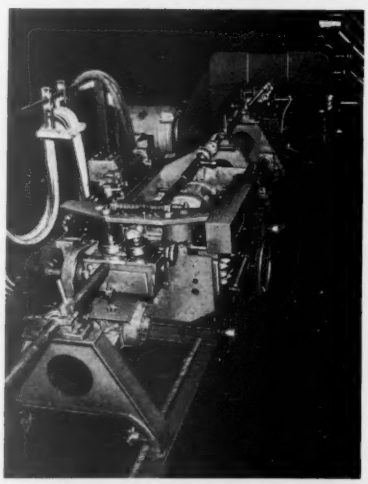
COMBINED DRAWING STRAIGHTENING CUTOFF AND POLISHING MACHINE



Payoff - Drawbench - Straightener



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Now available in two standard sizes, the revolutionary LOMATIC machines handle ferrous and non-ferrous rods and tubes at speeds up to 200 ft. per min. and with drawing capacities up to 16,000 lb. Compared to conventional separate rod drawing, straightening, polishing and cutting-to-length operations, the LOMA single-operation fully automatic machine offers the following major advantages:

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The complete line comprises an uncoiler, a pre-straightener, a drawbench, a roller straightener, a flying cutoff, a polishing machine and a discharge table. All components required for the complete sequence of processing operations are interlocked mechanically and electrically into one integrated and synchronized line which is controlled by only one operator.

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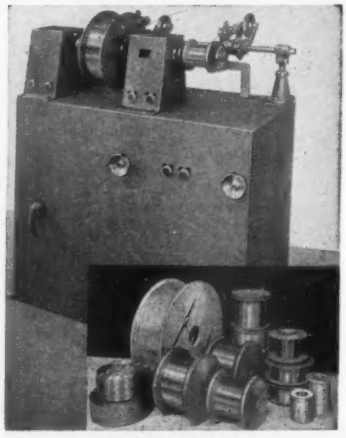

SPECIFICATIONS

Size Range: .010" to .080" or heavier if soft, and many flat wire sizes. Max. Spool Size: 16" flange diam. Capacity: Usually 2 to 6 spindles.

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ing, so that the shutter and sensing element are always positioned for a light beam of constant thickness to pass between them and the cable surface.

* * *

Fixed, as well as revolving heads are being studied and sensing elements of both, the inductive and capacitive types have been developed for use in this system.

* * *

The new monitor is intended for installation adjacent to the extruder where the insulant is still plastic.

* * *

In parallel a second type of instrument has been developed for use inside the cooling trough and immersed in the cooling water. (Pats. applied for). This employs a capacitive measuring system, in conjunction with electro-optical means of focusing the fields in the required directions. Both systems show considerable promise, and the field trials now in progress will serve to evaluate their respective merits and uses.

Literature

(1) Brit. Patent 574 618 — 1946, etc.
(2) Brit. Patent 778071, etc.
(3) Brit. Patents 798 399, 797633, etc.
(4) U. S. Patent 2554 164
(5) Brit. Patent 791 813

Forms Wire Product Division

Turnbuckles Inc., Osborn Bldg., Grand Beach, Mich., formed a Wirecraft Division, to be operated under the management of **R. E. Swanson.** The division occupies an addition to the plant and is equipped to produce automatic wire forms, wire parts, welded wire assemblies, wire displays, threaded wire hardware and staple wire products. All products can be furnished with zinc, cadmium, nickel, copper, brass, or chrome finishes.

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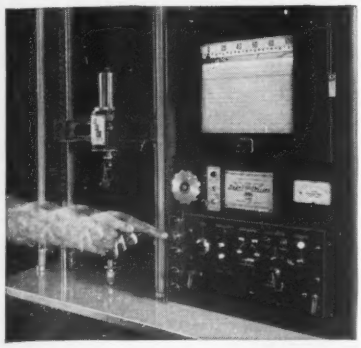

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Modernization Pays Off for Wire Cloth Manufacturer — Benefits Consumer

(*Continued from page 465*)

ing 15 pounds. The material is then stabilized in electric "Dispatch" ovens before moving to the weaving department.

* * *

The next process is the preparation of the loom beams. This warp winding operation is a precision one and requires special equipment, along with a highly skilled operator. It is at this point that the width, mesh and linear feet to be woven are determined. Normal fly screen mesh is 18 mesh per inch; consequently on a 50″ width beam, 900 individual ends of wire are drawn through from the warp rack and wound onto the beam. Of importance here from a labor and time saving standpoint, is the capacity of the high-speed loom beam. It will hold from 15,000 to 18,000 linear feet of wire, while the old conventional loom beams held but 4,500 linear feet.

* * *

Once wound, the loom beams are placed in position on the weaving machines and tied in ready for operation.

* * *

Actual weaving continues until the beam or warp is emptied and is ready to be replaced by another full beam previously scheduled for the particular loom. The machines run for an average of 1½ hours before changing mill spools. This is significant, since our old machines had to be stopped every 12 to 15 minutes for bobbin changing. Also, the conventional looms were versatile in increments of 6″ only, with different width looms required for different width cloth beyond the 6″ range. The new high-speed machines are versatile in any width up to 50″. In addition, they have greater uniformity of weave and lack fly-back.

* * *

Finished screen cloth is removed from the looms in 1,000 ft. rolls, and taken directly to the painting tower. It is run through this paint tower at a speed of approximately 30 ft. per minute and

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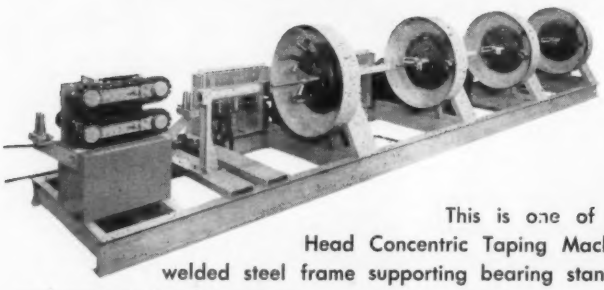

This is one of EDMANDS' Multiple Head Concentric Taping Machines. Has one-piece welded steel frame supporting bearing stands for taping heads and supports for the capstan.

Driven by v-belt from Louis Allis Adjusto-Speed Drive for slow starts and speed variation. Capstan is tractor type, using change gears to control rate of lay.

Taping heads mounted in ball-bearing pillow blocks. Any head can be clutched out at will. Tape pads also mounted on ball-bearings. Heads fitted with electrical stop motions that operate at end of package or if tape breaks.

Heads accommodate pads of 12, 16, 18, 19, 22 or 24 in. dia. and 3/8" to 4" in width. Supplied with as many heads as needed.

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First, there's Western Wire & Textile Machinery, Inc., the only company in the West that deals exclusively in used and reconditioned wire and cable-making equipment.

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Nowhere else in the West will you have a better chance of finding exactly what you need---either new or used. Nowhere else in the West will you be able to trade in old equipment on new. Nowhere in the West will you find such a complete stock of machinery and equipment.

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a drying temperature of about 275°F.

* * *

The painted cloth is allowed to "cure" for a 24-hour period and then is processed through final inspection and boxed per the customer's specifications.

* * *

Throughout the entire production setup, quality control procedures are carried out each step of the way, including major quality checks following wire drawing, warp winding, weaving, painting and, of course, in final inspection and packaging.

* * *

The important quality "bonus" we mentioned in the beginning as resulting from our modernization program, however, is not just a function of careful quality control procedures. It is rather an integral part of our machinery performance. Properly set, our new high-speed looms weave wire screening that is unsurpassed by that produced by our other methods and equipment.

* * *

This fact, coupled with the production rate increases and cost savings we have achieved, makes it possible for us to sell a premium quality product at standard prices.

Ethylene Copolymers for Wire Coating

(*Continued from page* 468)

for many wire and cable uses. One of the tests commonly used is a comparison of the tensile properties of stripped coating before and after aging at 100°C for 48 hours. Table VII, a comparison of the tensile properties of stripped copolymer coatings before and after aging in a forced draft oven, shows the excellent stability to high temperature aging of the copolymer resin compounded with proper antioxidants. Comparisons were made at crosshead speeds of 20 inches per minute and 2 inches per minute.

* * *

TABLE VII

EFFECT OF OVEN AGING AT 100°C FOR 48 HOURS ON TENSILE PROPERTIES OF THE BLACK COMPOUND (TR-201)

Tensile Strength, psi		
Unaged	20 inches/minute	3160
	2 inches/minute	2990
Aged	20 inches/minute	3340
	2 inches/minute	3010
Elongation		
Unaged	20 inches/minute	130
	2 inches/minute	>600
Aged	20 inches/minute	70
	2 inches/minute	>600

The copolymer resin as with other polyethylenes is not inherently resistant to ultraviolet degradation (4,5). However, the addition of 2½ to 3 per cent of a well dispersed finely divided channel black gives ample protection against outdoor weathering. Based on accelerated tests in an Atlas Weather-Ometer a service life in excess of 20 years would be predicted.

Extrusion Equipment and Conditions

Extruders having a 20:1 or larger L:D ratio are preferred but in many cases excellent results have been obtained with shorter barrel extruders. Most of our extrusion coating work in the laboratory has been done on a 1½" commercial extruder with a 16:1 L:D ratio. The screw in this extruder is a rapid transition metering type with a 4:1 channel depth ratio. Specially designed screws are not necessary. Generally speaking, however, a metering type screw with a channel depth ratio of at least 3:1 is preferred.

* * *

Varied screen packs have been used in the laboratory but a 20-80-20 pack seems to create enough back pressure for sufficient working of the melt with a minimum of loss in extruder output. Finer mesh screen packs may be necessary with less restrictive dies or with extruders having small L:D ratios.

* * *

A conventional crosshead and pressure type dies are most commonly used. Both the crosshead and

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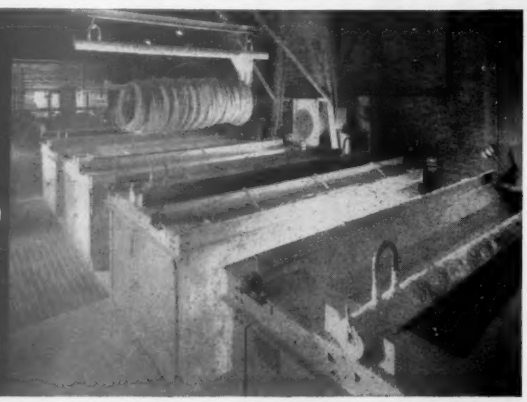

Faster baking, greater fuel economy, maximum production efficiency are just a few of the results of the exclusive heating arrangement of the Carl Mayer Hi-Speed Rod Baker. It also has a patented blow-off feature which removes moisture without damage to coils.

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the dies should be designed as streamlined as possible by blending all angles smoothly. The wire guide tip and inner die surface should be highly polished. The approach angle in the die should be around 30° to 45°.

* * *

These design features will minimize any "hold-up" of resin which can cause rough and irregular coatings.

* * *

Die land length has not been investigated fully but indications are that usually a 10:1 land length to coating thickness ratio is ample. Well designed crossheads, dies and tips having small approach angles, and an extruder which provides adequate and uniformly plasticized resin make long lands unnecessary. Excessively long lands will greatly reduce the output of an extruder, especially in the small wire sizes. The die opening should be in the range of "on size" to ten per cent larger than the coated wire. Too much drawdown will sometimes cause a surging or thick and thin effect on the coating. This is especially true at high rates of speed and is probably due to the drawdown exceeding the melt extensibility of the resin.

* * *

The resin temperatures needed to obtain good coatings will vary depending on conductor size, coating thickness, and coating speed. Generally temperatures should be in the range of 475°F to 600°F. Small wire sizes, thin coatings, and higher speeds require the higher stock temperatures. Metal temperatures in the barrel of the extruder, crosshead and die are not always a good indication of actual compound temperatures, therefore it is very desirable to have a means of measuring the actual melt temperature of the resin in the die. This is usually done by inserting a thermo-couple directly into the melt somewhere in the crosshead.

* * *

It has been found that it is necessary to preheat the conductor in most cases to insure proper adhesion of the coating

and to provide maximum coating elongation. Preheating the conductor will also assist in preventing voids. Conductor temperatures needed will vary with the type of conductor, compound temperatures, and coating speed. Usually about 150°F to 200°F is recommended. The heating may be done in a number of ways; gas flame, electrical resistance, or hot air ovens.

* * *

Adequate water baths are needed for cooling the coated wire. The temperatures and lengths of the baths needed will change with other extrusion variables but water temperatures of about 180°F are needed with coating thicknesses greater than 20 mils. Cold water baths will cool the coating too fast causing void formations in the coating. It is sometimes necessary to run the coated wire through a very short cold water bath prior to entry in the hot bath to prevent "water marks" caused by water boiling on the surface of the coating.

* * *

A capstan which provides even draw-off with accurate speed control is essential. Smooth starts are very important to avoid breaking the conductor when running small sizes. Experience has shown that the processibility of the copolymers is such that commercial coating rates can be obtained.

* * *

Following is a description of a typical run on a #24 seven strand copper conductor. Coating thickness was 0.007".

Extruder	
Diameter—	1½"
L/D Ratio—	16:1
Screen Pack—	20/80/120
Screw—	Rapid transition metering with 4:1 channel depth ratio
Temperatures—	Rear zone, 550°F; Front zone, 565°F; Die, 565°F; Stock 565°F.
Speed—	140 rpm
Die	
Orifice Size—	0.040"
Approach Angle—	36°
Land Length—	0.0625"
Water Bath	
Temperature—	140° — 150°F
Length—	12'
Coating Speed—	710 ft./min.

Test Installations

Large quantities of wire have

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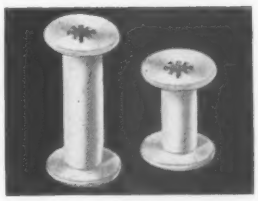

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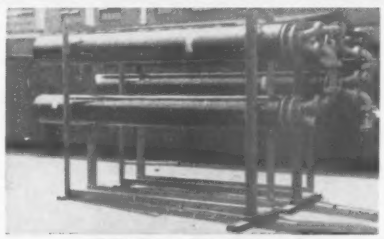

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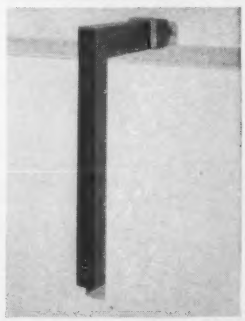

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been coated and tested at our Sales Service Laboratory. This laboratory testing has given a wealth of data. However, the final acceptance of any resin depends on its performance in service. Test installations provide the opportunity to obtain service life data and handling advantages and/or deficiencies. With these desired goals, early in 1959 test installations were made. The varied manufacturing plants within Phillips Petroleum Company offer many excellent locations for test cables. The following test installations are typical.

1. **Pipeline cathodic protection systems are direct burial applications in very corrosive soils. Presently nylon insulation with a PVC coating is used. The total coating thickness for a No. 2 stranded copper wire is 7/64". Marlex insulated wire with 4/64" coating has been installed in several of these systems. Performance has been satisfactory with a savings in wire costs.**
2. **The utility distribution systems of the many company camps across the country make ideal test installations for tree wire. In addition to abrasion evaluation, the varied geographical locations give a wide range in service temperatures. No. 4 aluminum wire with Marlex coating is being installed in these areas.**
3. **Corrosive atmospheres are prevalent in most petroleum processing plants. Multi-conductor armored cable in overhead open conduits is standard construction in several plants. Series 5000, Type 3 black Marlex resin has replaced PVC as a jacketing material on cables recently installed in a new HF alkylate unit. The jacket will provide maximum protection from corrosive vapors, moisture and weathering.**
4. **Geophysical cable is used extensively throughout the petroleum industry. The cable is generally laid over all types of terrain and subjected to the heavy oil field traffic. The use of ten mils of Marlex 5000 resin as the insulating material on #24 stranded wire has reduced cable damage.**

* * *

Approximately 40,000 feet of Marlex resin coated wire ranging in size from #14 to #3/0 has been installed in services similar to the above. Almost a year's service has been logged on these installations. While this is a short period compared to the expected service life of an insulating material, it definitely points up the improved properties of the Marlex copolymer. Also, no major handling problems were encountered. Splices

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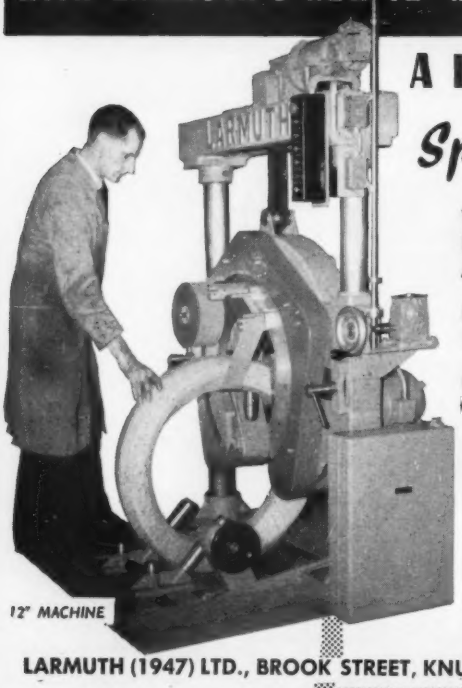

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were made using Bi-Seal self-bonding polyethylene 2A with Scotch No. 33 covering and Scotchkote overwrap. The slight increase in stiffness of coated wire was in most instances over-shadowed by the ease of pulling in conduit installations. Soaps and other type lubricants normally used were not required.

Conclusion

The use of linear polyethylene by the wire and cable industry has been slow to develop. However, with the industry's desire for improved coating materials the use of tailor-made resins, such as Marlex 5000 resin will increase. The balance of processibility with excellent physical, chemical and electrical properties of the Marlex 5000 copolymers makes them ideal for many applications requiring quality coatings. Communication cables, geopyhsical cable, tree wire, drop wire and power cable are a few of the many applications.

References

1. DeCoste, J. B., Malm, F. S., Wallder, V. T., "Cracking of Stressed Polyethylene", *Ind. Eng. Chem.*, Vol. 43, Pages 117-121 (January 1951).
2. Reiss, J. H. Lanza, V. T., "Wire and Wire Products", 33, 1182-1187 (October, 1958).
3. Jones, R. V., Boeke, P. J., Clark, W. R., "Physical, Chemical and Electrical Properties of MARLEX Ethylene Polymers", Fourth Annual Wire and Cable Symposium, (December, 1955).
4. Wallder, V. T., Clarke, W. J., DeCoste, J. B., Howard, J. B., *Ind. Eng. Chem.*, Vol. 42, Page 2320 (November, 1950).
5. Burgess, A. R., "Photo-Oxidation and Stabilizations of Polyethylene", National Bureau of Standards, Circular #525 (November 16, 1953).

New Modern Magnet Wire Plant

(*Continued from page 473*)

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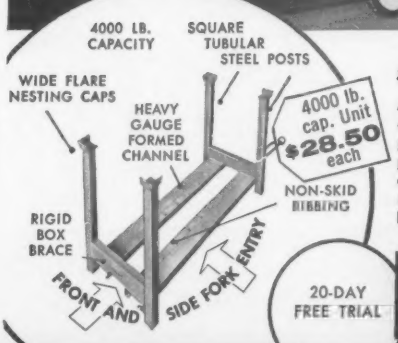

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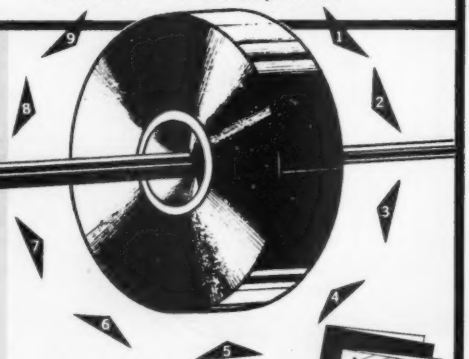

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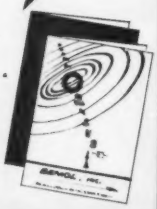

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Mechanized Setups Make Precise Rod Bends at High Rates

(*Continued from page* 470)

the ends of the rod to be bent at right angles to the rod axis in opposite directions as the side die elements contact and are wiped across the rocking die elements, one at each side.

* * *

As the ram retracts, pushout pins elevate the bent rod and air jets blow it forward into the chute, the die then being rocked back to position for reloading the holder. When the feed plunger retracts, it permits another rod to drop to loading position ready for advance into the holder in starting the next cycle. About 25 rods a minute are given two bends in this setup.

* * *

All events of the cycle are controlled by limit switches operating air valves in precisely timed sequence and all the operator need do is to keep the hopper supplied with rods cut to length. If springback of the rod stock is significant, the air plunger of the rocking cylinder can be set for enough extra travel to compensate for this and yield true 90-deg. bends.

New Continuous Casting Process for Copper Wire Bars

(*Continued from page* 472)

motor to obtain infinitely variable casting speeds up to 60 in. per min.

Flying Saw

Immediately below the withdrawing rolls and mounted on a

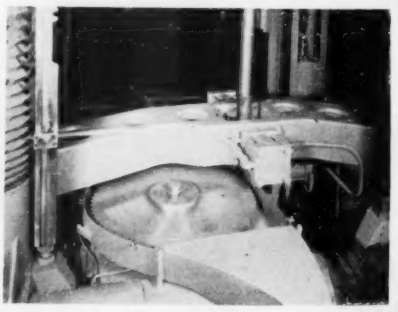

Figure 4 — Closeup view of flying saw cutting through a billet being gripped by the double clamps. * * * * * * * * * *

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The Standard of the Wire Industry

traveling carriage is the flying circular cut-off saw. The vertical travel of the saw is along two of the four main columns of the machine, while its horizontal travel is along two horizontal columns on

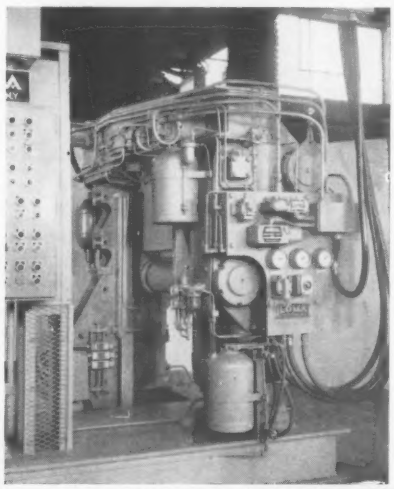

Figure 5 — Operator's control station with electrical and hydraulic machine controls.

which the traveling carriage is guided. During cut-off, the descending castings are engaged by hydraulically operated clamps situated on both sides of the sawblade.

* * *

The saw employs a 36 in. diameter high speed steel segmental blade driven by a 40 h.p. motor at 1200 ft. per min. The cutting feed rate is adjustable up to 2 in. per

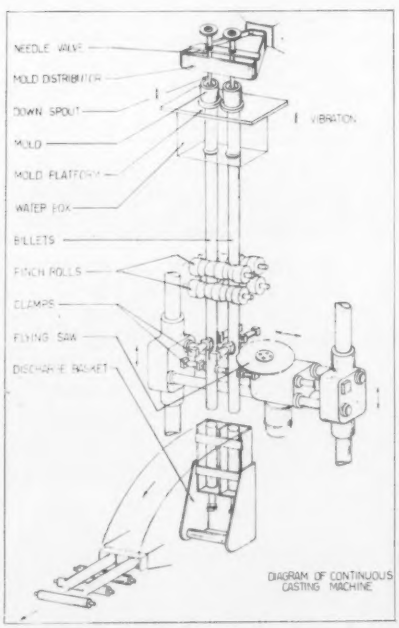

Figure 6 — Diagram of new Continuous Casting Machine.

* * * * * *

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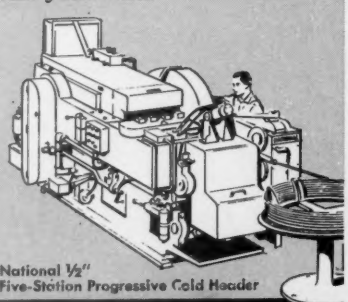

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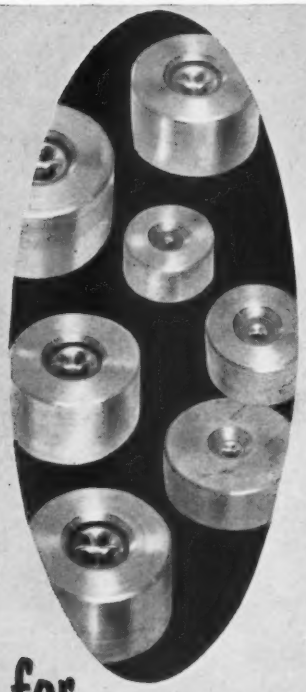

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(4) Rapid cooling produces a fine-grained, sound structure even in large cross sections.

(5) Predominantly longitudinal solidification prevents piping and internal stresses.

(6) Long casting length and absence of cropping losses improve yield.

(7) Simple, short molds reduce cost of and space required by casting shop inventory.

Extended Field Testing of Stainless Wire

(*Continued from page* 477)

water a white coating was noted. Chemical analysis identified the coating to be a lime deposit. Drum-wound wires were coated with lubricant heavily loaded with river silt. No evidence of corrosive attack could be discerned in any sample.

* * *

Chemical analysis of representative wires from the samples is shown in Table III.

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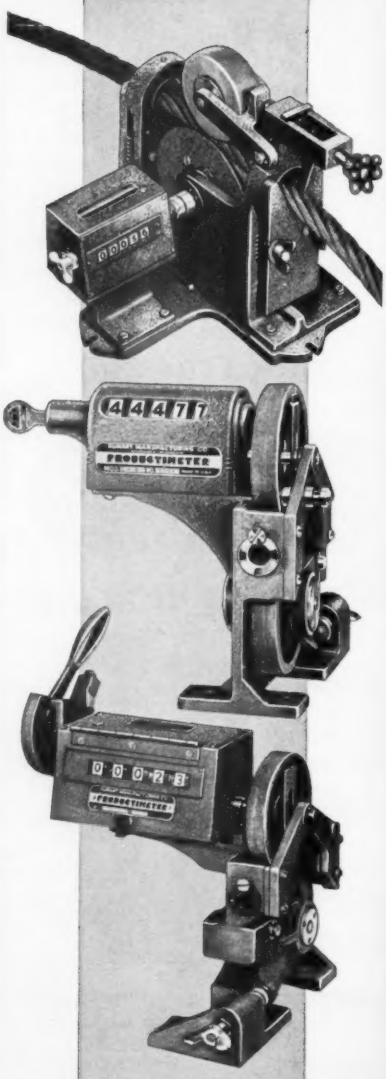

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Wire Kinks

(*Continued from page 481*)

tional area. This is classed as coarse wire.

* * *

After about 8 drafts the wire is so work-hardened that it must be annealed to soften it for further drawing. Annealing permits the stressed and deformed metal grains to resume their normal state, making it "soft."

* * *

Intermediate sizes of wire range from .128" to .028" in diameter, after which they are called "fine wires." Annealing must be repeated after about each 8 drafts.

* * *

You mention high tensile wire. Possibly you mean "work-hardened." After the wire has been drawn the maximum number of drafts possible, the wire has a much higher tensile strength than in its soft state. The term "high tensile," however, is usually applied to high carbon wires having very high tensile strength. Concerns wanting this maximum hardness specify "hard drawn wire."

* * *

Low carbon wires in the coarse and intermediate size ranges are usually drawn "dry." That is, a powdered soap, tallow or grease type lubricant mixed with lime is employed as a lubricant, which the wire picks up as it passes through the lubricant box ahead of a die.

* * *

Fine wires are usually drawn "wet", that is, in a water soluble soap solution. In the finer sizes diamond dies are employed.

Ammonium Persulfate

Question

We would appreciate it very much if you could give us information on the specific uses of Ammonium Persulfate in the wire industry. We have seen some references to its use in wire dipping, etching of metals and in the manufacture of forgings.

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Railroad Street

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STEEL and CARBIDE

CENTRAL CARBIDE NOZZLES OR TIPS have extremely long life and cut costs.

Our STEEL DIES are made Round, Figure 8, Serrated, Tracer—or in special shapes.

Highest quality of workmanship and materials. Semi-Finished Standard dies and TIPS in stock. Special shapes to specification.

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FINE WIRES

Bare Annealed No. 36 A.W.G. and Finer
From Copper—Cadmium Copper—Bare and
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For Stranding and Shielding

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THE MONTGOMERY COMPANY

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TRADITIONAL IMPORTERS OF STEEL PRODUCTS

Wire Rods and Wire, bright basic, black annealed, and galvanized, in all usual qualities and for many specialty purposes, including Box Binding Wire, Spring Wire, Mattress Wire, Core Wire, Rope Wire, etc.

INQUIRIES INVITED

Reply

Ammonium persulfate is produced commercially on a very large scale and finds uses in various fields and particularly also in the metal finishing industry. Here it is well established for the etching of printed circuits, the cleaning of copper prior to coating or plating and on a small scale for treating brass prior to painting. It has aroused interest in the electric wire and cable industry for the purpose of cleaning copper wire before applying an insulating coating or enamel. This potential use is still in the development stage. However, ammonium persulfate is being used commercially to deoxidize and clean copper wire before silver plating. Such a silver plate is commonly applied as an undercoat for Teflon coating on wire.

New Use For Prestressed Concrete

Southeastern railroads have just begun testing railroad ties made of prestressed concrete. These are of standard size, but much heavier (about 525 lbs. total) than wood ties. They are prestressed with a total force of 75,600 p.s.i., based on tensioning of 70% of ultimate cable strength. The result is a concrete tie with a 28-day compressive strength of approximately 6,000 p.s.i.

* * *

Flexibility of manufacturing process allows a number of features to be built into prestressed concrete crossties that, according to the manufacturer, give it certain advantages. A slight concavity on the bottom side of the tie, which is 12 inches wide (9 inches on top), helps it to hold its ballast in place and prevents creep. Spikes are eliminated. Ties are bolted to rails by means of a unique spring clip, which also helps to absorb vibration.

* * *

American Concrete Crosstie Corp., which uses steel strand made by the **John A. Roebling's Sons Division** of the Colorado Fuel & Iron Corporation in prestressing its ties, claims to have developed mass production methods making possible the production of 1,000

ties per day. Estimated value of a tie is $9.00. While higher than the price for wood ties, the manufacturer states that tests show that ties can be placed 30 inches apart, necessitating 2112 ties per mile vs. 3250 per mile in ties made of wood. The concrete ties last indefinitely.

New Line of Slings

A new line of slings that provides firm but gentle support in a wide variety of industrial and pipeline applications is now being introduced by the **Colorado Fuel & Iron Corporation.**

* * *

"Swing Sling", CF & I's new answer to the perennial problem of lift without damage, consists basically of parallel high-strength aircraft cables covered with rubber grommets which are secured at the ends by special attachments. The grommets' wide-bearing rubber exterior protects against damage to a coating or other penetrable surface on the object to be lifted.

* * *

Because of exceptional strength and holding power, one "Swing-Sling" can handle many lift jobs which usually require two conventional-type slings. Extreme flexibility, light weight, and long life are other significant "Swing Sling" characteristics, according to CF & I.

* * *

"Swing Slings" were developed and are manufactured at CF & I's Palmer (Mass.) plant.

American Woodworking Company

The American Wood Working Company, specialists, since 1886, in automatic wood turning, announce the completion of a new plant, in the heart of their raw materials market, in Montello, Wisconsin.

* * *

The plant, covering a single level area of 40,000 sq. ft. is air conditioned and dust-proofed. It has been designed and engineered to produce, under rigid quality control, with speed and efficiency, thousands of turned wood parts.

3 BIG NEW DEVELOPMENTS . . . .

The NEW Winder for BRAIDER BOBBINS

AND

The NEW RE-SPOOLER

FOR

HIGH SPEED PRECISION WINDING

AND

THE NEW PERFECT SPOOLER FOR ANNEALING AND ENAMELING TAKE UPS
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Write or phone now for details that will help you.

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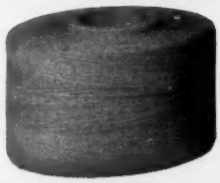

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Music Wire for Industrial Purposes
211 sizes Bright Polished, .0015" to .250"
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Aluminum—Annealed—Belt Lacing—Brass, Soft and Spring—Copper, Bare and Tinned
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Monel—Nickel Silver—Pure Soft Nickel—Oil Tempered, Steel Spring, Black Finish
Phosphor Bronze, Spring Temper—Pure Iron Wire—Resistance Wire,
Hoskins Chromel "A"—Stainless, Soft and Spring Temper—Tag Wire, 1000
in an Envelope—Florist Wire—Spooled and Coiled, ¼-½-1-5#
Wires Straightened and Cut to length—Small Gauges—Small orders our specialty
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BELL MINE LIME PRODUCTS

Strict laboratory control assures uniform quality

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Sales Offices
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Included are reels, spools, handles, wedges, wheels, knobs, dowels, blocks, mouldings, and many other products.

* * *

The results of intensive research on the characteristics of domestic woods are presented in an attractive, easy to read, chart. Write today for your copy.

Weights and Strengths of Wire Rope Published in New Bulletin

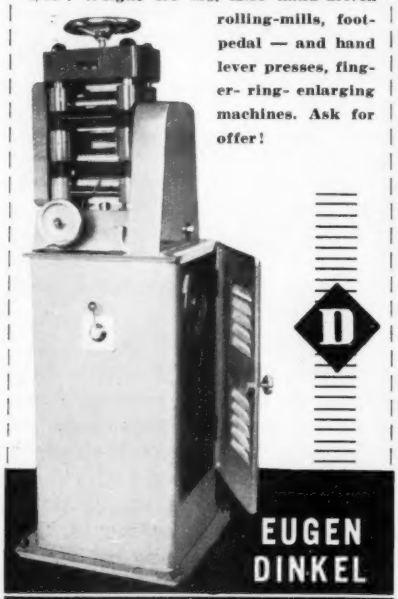
A condensed catalog listing of new up-to-date weights and strengths of both Improved Plow Steel (Monarch Whyte Strand) and Extra Improved Plow Steel (Premium Whyte Strand) have been recently released in new bulletin #6025.

* * *

Also included in bulletin is explanation and description of wire rope constructions and types plus helpful information for ordering wire rope. Bulletin #6025 is available free on request to **Macwhyte Wire Rope Company,** Dept. P. R., Kenosha, Wisconsin.

DOUBLE ROLLING-MILL,

electric-driven, rollers 2.½" x 5.⅛" long, for sheets ⅜" to 1/128", for wires 5/16" to 1/25". Weight 495 lbs. Also hand-driven rolling-mills, foot-pedal — and hand lever presses, finger- ring- enlarging machines. Ask for offer!



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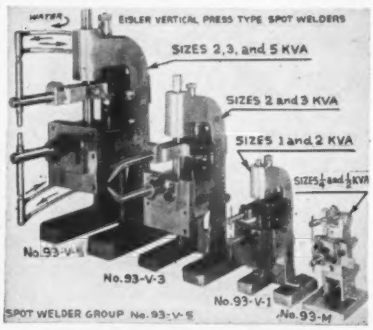
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New Enameled Wire

The ultra fine, high resistivity, low T.C. wire known as "Moleculoy"* and manufactured by **Molecu-Wire Corporation,** is now being successfully coated with a high temperature polyester enamel which greatly broadens the applicability of wire in electronic design engineering because of improved mechanical, chemical, electrical, abrasion resisting, and thermal properties.

* * *

Moleculoy itself is a nickel based, non-magnetic, 800 ohm, ± 10 PPM TC alloy with excellent stability over a wide temperature range of —65° C to + 150° C. It is made in diameters from .0004" to .010", and can be readily soldered, brazed or welded. It is available in bare, enameled, oxidized and fabric finishes. The po-

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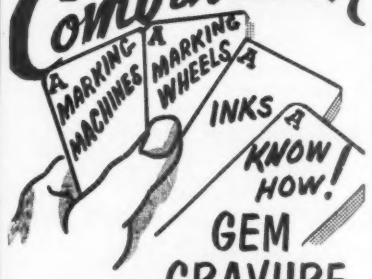
An UNBEATABLE Combination



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10 Models of Precision-built Markers for Printing, Striping or Embossing.
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NEW-Hardened Gravure wheels give years of service. Reproduction of any Type face or Trade-mark.
INKS:
For Hot or Cold applications in Navy-Chip Colors. Our Inks have passed all present solvent and abrasion tests.
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Our staff of trained personnel, headed by Wire and Cable Engineers with a background of many years experience, stand ready for consultation on every marking problem.
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West Coast Representative:
PAUL I. KENNER,
230 Shaw Rd., South San Francisco, California

tentiometer grade, bare or wash-coated, wire is oxide and lubricant free, minimizing noise characteristics.

* * *

For complete information write to Molecu-Wire Corporation, Scobeyville, N. J.

* Reg. Trade Name

Guide to Silicones

A 1960 guide to General Electric's complete line of silicone products is now available in an eight-page illustrated bulletin.

* * *

Listing major product uses and benefits, this publication features G-E silicones for: antifoam and release agents, lubricants, paper release, cosmetics and polishes, masonry water repellents, paint and paint additives, textile finishes, and electrical insulation. Another section is devoted to silicone rubber, including liquid RTV (room temperature vulcanizing) silicone rubber compounds.

* * *

Identified as CDS-129B, this guide also contains information for obtaining additional detailed information on specific silicone products.

* * *

Copies of CDS-129B may be obtained from General Electric's **Silicone Products Department,** Waterford, N. Y.

Alpha Wire Sold to Loral Electronics

Loral Electronics Corporation has announced the acquisition of **Alpha Wire Corporation,** according to **Leon Alpert,** President and Chairman of the Board of Loral.

* * *

The acquisition of Alpha marks the initiation of the first phase in Loral's planned program to diversify its sales and distributional efforts into commercial areas of related industries.

* * *

Diamond Powders
Of First Quality Only

For assured quality, accurately graded diamond powders

Specify
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WE BUY SWARF, SLUDGE AND LAPPING COTTON

RECLAIMING SERVICE
We also reclaim and return to you the diamond content, guaranteed 99% pure and graded for further use.

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BALLOFFET VIANNEY WIRE DIE CO., Inc.

All sizes from .104" down to .0004" in stock

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DESIGNED FOR LONG LIFE AND MAXIMUM WIRE PRODUCTION

Furnished semi-finished to within .001" to .002" of finished size at rough-drilled die prices. Require only light sizing and polishing before using. Our dies embody special design features that make for superior performance.

ALSO, A FULL LINE OF CARBIDE TOOLING FOR THE COLD HEADING INDUSTRY

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DIAMOND DIES .0006 - .120 DIAMOND POWDER
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DIAMOND DIES, DIAMOND POWDERS
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CARBIDE NAIL TOOLING
For
Domestic and Foreign Machines
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Diamond Reclaiming Services
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FINE and MEDIUM SIZE WIRE
TAKE-UPS
8, 10, & 12 SPINDLES
COLBOURNE MACHINE COMPANY
21 MUNRO ST. • WINSTED, CONN.

DIAMOND WIRE DRAWING DIES
DIAMOND POWDER AND
COMPOUNDS
DIE RECUTTING SERVICE
CARBIDE DIES • TOOLS • PARTS
RUSCH WIRE DIE CORPORATION
CROTON-ON-HUDSON, N. Y.

Alpha will be operated as a division of Loral with **Peter Bercoe**, now President of Alpha, continuing in that capacity, and all other management personnel being retained.

* * *

Alpha, in business since 1922, recently opened a West Coast facility to complement its 45,000 square foot production area in New York. Alpha manufacturers insulated wire, wire specialties, cables, cabling materials and insulating tubing for the aviation, automotive, missile, research, radio, building construction, etc., fields.

Brochure on Shaped Wire

Little Falls Alloys, Inc., of 189 Caldwell Ave., Paterson, N. J. has published the fourth of a series of pocket brochures illustrating and explaining the applications of specially shaped round, flat, square and rectangular wire.

* * *

The brochure mentions a number of applications where shaped wire is known to be especially used in the mass production of tiny parts, and the various alloys and finishes, in which the wire is available.

* * *

Other pocket brochures previously published, similarly describe the properties and specifications of Ni-Clad-Ti (nickel clad titanium) wire, beryllium copper wire and bronze and brass wires. A fifth brochure will complete the series, describing hot solder dipped — tinned and other type finishes.

* * *

Further information may be obtained by writing directly to the manufacturer and requesting either the pocket brochure on "shaped wire for mass production of tiny formed parts" or the complete series of brochures on Special Alloy Wire.

Develops New Fine Wire Packaging Guide

A new data sheet showing the variety of put-ups on fine wire made by **Riverside-Alloy Metals Division**, H. K. Porter Company, Inc., explains the various put-ups

DIAMOND DIES
.0002 to .128
For many years . . .
Outstanding in quality,
workmanship and service.
FORT WAYNE WIRE DIE, INC.
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"Natdi"
REVERSIBLE DIAMOND DIES
NATIONAL
WIRE DIE CO. INC.
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DIAMOND DIES
mounted unmounted
For Precision Wire Drawing
BRENON, INC.
Experts in Fine Size Diamond Dies
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KELLY
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Diamond Dies for
Wire Drawing
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WALLINGFORD, CONN.
SPARKERS — TAKE-UPS
CAPSTANS — PAY-OFFS
SPOOLERS — TRAVERSES
TEFLON EXTRUDER

OUR NEW ADDRESS
FEDERAL MFG. CO.
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WOOD REELS
FOR
CABLE • ROPE • WIRE
QUICK DELIVERIES ON
ASSEMBLED OR
KNOCKED DOWN REELS
SHIPPED FROM BALTIMORE, MD.
HARTSELLE, ALA. (BAKER MFG. CO.)
The NELSON Company
STANDARD OIL BLDG. BALTIMORE 2, MD.

CARRIS REELS, INC.
Specialists in the design and manufacture of Plywood Reels and Hardboard Spools.
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AJAX ELECTRIC
SALT BATH FURNACES
for fast, economical heat treatment
AJAX ELECTRIC COMPANY
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WIRE DRAWING MACHINERY
AND EQUIPMENT
Rod Frames — 16" Frames, 8" Frames — Take-Up Frame, Wire — Pointers — Pulley Tongs — General and heat resisting alloy castings for wire mill use.
Circulars on Request
E. J. Scudder Foundry & Machine Co.
TRENTON, N. J.

WOOD REELS and SPOOLS
1" to 60" Diameters
American Wood Working Company
MONTELLO, WISCONSIN

WORK WITH WEBB
for finer quality wire
Stainless • Needle • Nickel Alloy
WEBB WIRE
DIVISION OF THE CARPENTER STEEL CO.
NEW BRUNSWICK, N. J.

DEPENDABLE WIRE EQUIPMENT
FINE WIRE DRAWING MACHINES
RESPOOLING MACHINES
WIRE PLATING EQUIPMENT
SCREW TYPE TRAVERSES
HODGE BROS. MACHINE SHOP
2 HAVELL ST. • OSSINING, N. Y.

SAXL TENSION METERS
Quick Trigger Action
For Wire Drawing, Insulating, Enameling and Coil Winding
American made and serviced, always reliable
TENSITRON, INC., Harvard, Mass. Patented

in which each type of fine wire is available.

* * *

Since the "Alloy" plant of the Division packages fine wire in a number of different sizes of Pay-Off-Paks, coils and spools, it was decided to simplify the method of presenting the packaging alternatives by organizing the information into chart form, grouping the various alloys and breaking these groups down into size ranges.

* * *

A quantity of the new sheets will be on hand at each Riverside-Alloy district office. Additional copies can be secured by writing: Publications Section, Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Riverside, New Jersey.

IDA Holds Convention

The Industrial Diamond Association of America, Pompton Plains, N. J., at its 15th Annual Meeting and Convention held at the Hollywood Beach Hotel, Feb. 22-26, elected the following Officers to serve for the coming year: President, **Bernard Jolis,** U. S. Industrial Diamond Corp.; First Vice-President, **Leopold H. Metzger,** Super-Cut, Inc.; and Second Vice-President, **Charles Baumgold,** Diamond Tool Research Co., Inc.

* * *

Directors elected for the following two years were: **Joseph Klipper,** Clipper Diamond Tool Co., Inc.; **Frederick W. Lindblad,** U. S. Diamond Wheel Co.; **Herman J. Meinert,** J. K. Smit & Sons, Inc.; and **Charles B. Proudfoot.**

* * *

The out-going President, **Donald J. Wallace,** Wheel Trueing Tool Co., will also serve as Director for the coming year. Directors elected last year who will remain in term for one more year are: **Donn E. Stone,** J. K. Smit & Sons of Mich., Inc.; **Jan Taeyaerts,** Precision Diamond Tool Co.; and **John Van Itallie,** The Van Itallie Corp.

* * *

The Convention opened on Feb. 22 with 5 committee meetings and the Board of Directors meeting, followed by the Officers' Recep-

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Wood, Plywood, Hardboard
8" to 72" in diameter
Durkee Manufacturing Co.
Inc.
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RESPOOLING MACHINES
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Machine Co., 21 Munro St.
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SPIRAL WRAPPING MACHINES
For Coils or Straight Lengths
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THE PLATT BROS. & CO.
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METALLIZING WIRE
PURE ZINC and CADMIUM
Other Fine Bare Wires
Manufactured to Your Specifications
IMMEDIATE DELIVERY
STAMFORD PROCESSING CO.
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mechanical
wire rod descalers
FISHER ASSOCIATES
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Steel & Wire machinery co.
15457 EUCLID AVE. CLEVELAND 12, OHIO
EXCLUSIVE DISTRIBUTOR FOR FARMER NORTON WIRE DRAWING MACHINES

Immediately Available
WIRE WORKING MACHINERY
FOURSLIDES: Baird, Nilson & Manville, Nos. 0, 1, 2, 3, 4, 5, 3-20, 4-26
U. S. Tool Co. No. 22, 28, & 33 Multislides
Sleeper & Hartley Spring Coilers Nos. 0, 1, 2, 3, 3½, 4, & 5 & Torrington W10 & W12
Vaughn No. 8, 10, & 12 Moto-Blocs
Waterbury No. 3 Bull Blocks, Duplex
Morgan 4 stand Wire Drawer with pointer and 100 H.P. motor drive & motor
Waterbury Nos. 1, 2, & 3 Continuous Wire Drawing Machines
PARTIAL STOCK LISTING
"The most diversified stock of machinery in the country. If it's machinery we have it."
National Machinery Exchange
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CAnal 6-2470

FINE WIRE ENAMELING OVENS
COLBOURNE
Machine Co., 21 Munro St.
Winsted, Conn.

FOR SALE — WIRE WORKING MACHINERY
1 — Four Wire Vertical Twister
1 - Oswego Rod Machine 5/16" to 14 ga.
3 - Oswego Step Cone, 13 Die Drawing Machines
12 - Wardwell Fine Wire Braiders
For Machinery to BUY or SELL — Call Us
PUT US ON YOUR MAILING LIST
JOHNSON MACHINERY COMPANY
683 Frelinghuysen Avenue, Newark, N. J.
Tel. BIgelow 8-2500

WANTED — USED SHUSTERS!
Models A, 1-A, and 2-A Automatic Wire Straightening and Cutting Machines.
Send full details to
BOX 1008
WIRE & WIRE PRODUCTS

FOR SALE
6 Syncro Model HS-1-A High Speed 7-Bay Tubular Stranders, like new. 15 lb. Pay-Off Spools with 1000 lb. Take-Ups. Machines practically new and are now running, can be inspected.
Write or Phone:
Victor Electric Wire & Cable Corp.
618 Main St., West Warwick, Rhode Island
Telephone VAlley 1-1700

I WISH TO PURCHASE INSULATED WIRE PLANT.
Replies will be treated with complete confidence.
MALCOLM R. WHITE
Box 301 Chester, New York

WANTED — USED LEWIS!
WIRE STRAIGHTENING AND CUTTING MACHINES.
Send full details to
BOX 1019
WIRE & WIRE PRODUCTS

tion and dinner. On Feb. 23 the Membership met in General Session and acted upon many activities of vital interest to the industrial diamond industry. These included standardization projects in the powders and compounds, wheel, tool and die segments; membership and practices procedures; and technical and government work.

* * *

The Association's Executive Manager, **Margaret J. McGinnis,** was in charge of proceedings and, Counsel **Meyer Boskey** was in attendance.

Opens New Haven Office

Wyrough and Loser, Trenton, N. J., has announced the opening of an additional branch sales office in New Haven to serve Connecticut and eastern New York. The address is 1388 Dixwell Ave., New Haven 14, Conn. The telephone is ATwater 8-3873.

* * *

New branch sales manager is **Carl A. ("Whitey") Larson,** a resident of New Haven. He is a graduate chemist and has been with the Whitney Blake Company, insulated wire producer, for some years both as development engineer and rubber chemist. The firm operates a branch office in Boston which serves upper New England.

* * *

Wyrough and Loser produce the Poly-Dispersion and act as exclusive sales agent in the northeastern United States for a number of chemical producers whose products are employed in rubber and plastics compounding.

New Sunbeam Distributor

Sunbeam Equipment Corporation, Meadville, Pennsylvania, recently appointed **Better Engineering Company,** P.O. Box 1944, New Haven 9, Conn., to handle the Sunbeam line of Industrial Heat Processing Furnace Equipment in the states of Connecticut, Massachusetts, Rhode Island, New Hampshire, Vermont and Maine.

Attractive management positions in Venezuela with wire and cable manufacturing plant operated by General Cable Corporation. ● Men with minimum of several years' experience supervising production of rubber and plastic wire and cables and also communication cables, for such jobs as division superintendent, foreman, production scheduling, etc. Excellent salary and liberal living allowances. ● New York interviews will be arranged for applicants possessing the necessary qualifications.

◆

PERSONNEL RELATIONS DEPT.,
GENERAL CABLE CORPORATION,
730 THIRD AVENUE,
NEW YORK 17, N. Y.

FOR SALE
200 — 23 x 3-1/2" x 16" x 1-15/16" Core Flanged Steel Reels
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453 Main Street Stamford, Conn.

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Selling mills, fabricators, and wire industry interested in drawing dies, diamond powder and other related items. Must be well established and rated firms.
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ERRATUM

On page 355 of the March, 1960 Wire and Wire Products the formula appearing as $d\ (mm) = \frac{CM}{39.37}$ should have read $d\ (mm) = \frac{\sqrt{CM}}{39.37}$ We regret the error and trust that it has occasioned our readers no inconvenience.

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ABRASIVES—
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Norton Co., Worcester, Mass.

ACID INHIBITORS—
(See Inhibitors, Pickling)

ANNEALING MACHINES — Electric Resistance
Syncro Machine Co., Perth Amboy, N. J.

ANNEALING POTS AND BOXES—
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

BAKERS—
(See OVENS—Rod Bakers)

BOBBINS—Braider & Wire Weaving
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Associated American Winding Machinery, Inc., New York, N. Y.
Molded Fiber Glass Tray Co., Linesville, Pa.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Plastic Mold & Engineering Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

BORAX—Wire Drawing
United States Borax & Chemical Corp., New York, N. Y.

BORON CARBIDE—
Norton Co., Worcester, Mass.

CABLE FILLERS—Paper
Ludlow Papers, Needham Heights, Mass.
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
Twitchell, Inc., E. W., Philadelphia, Pa.

CAPSTANS—for Wire (also Caterpiller Types)
Bartell Machine Tool Corp., Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Davis Electric Co., Wallingford, Conn.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
General Engineering Company (Radcliffe) Limited, Radcliffe, England
Larmuth & Bulmer Limited, Manchester, England

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

CASTINGS—Wire Mill
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CLEANERS—Metal
Apex Alkali Products Co., Phila., Pa.
Magnuson Products Corporation, Brooklyn, N. Y.
Miller, R. H., Co., Inc., Homer, N. Y.
Parkin Chemical Co., The, Pittsburgh, Pa.
Standard Industrial Compounds Co., Frankfort, Ill.

CLEANING & PICKLING EQUIP.—
Cleveland Tramrail Div., of the Cleveland Crane & Engineering Co., Wickliffe, Ohio
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

CLOTH—WIRE, All Metals
Wickwire Bros., Cortland, N. Y.

COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N. Y.
Miller, R. H., Co., Homer, N. Y.
Parker Rust Proof Co., Detroit, Michigan
Standard Industrial Compounds Co., Frankfort, Ill.
United States Borax & Chemical Corp., New York, N. Y.

COLOR CONCENTRATES—For Wire Coatings
Blane Corporation, The, Canton, Mass.

COMPOUNDS—Coppering
Miller, R. H. Co., Inc., Homer, N. Y.

COMPOUNDS—Diamond (Pre-Mixed)
Eastern Carbide Corp., New Rochelle, N. Y.
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Rusch Wire Die Corporation, Croton-on-Hudson, N. Y.

COMPOUNDS—Extrusion, for Wire
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.

COMPOUNDS—Metal Finishing
Apex Alkali Products Co., Philadelphia, Pa.
Parker Rust Proof Co., Detroit, Michigan

COMPOUNDS—Phosphate Coating
Parker Rust Proof Co., Detroit, Michigan

COMPOUNDS—Rust Preventing
American Lanolin Corporation, Lawrence, Mass.
Apex Alkali Products Co., Philadelphia, Pa.
Escambia Chemical Corporation, New York, N. Y.
Parker Rust Proof Co., Detroit, Michigan

COMPOUNDS—Rust Removing
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.

COMPOUNDS—Vinyl
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
General Tire & Rubber Company, The, Akron, Ohio
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Union Carbide Plastics Company, Div. of Union Carbide Corporation, New York, N. Y.

COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N. Y.
Miller, R. H. Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.
Swift & Company, Chicago, Ill.
United States Borax & Chemical Corp., New York, N. Y.

CONDUCTORS—Flexible, Electrical
Montgomery Co., The, Windsor Locks, Conn.

CONTAINERS—Wire Packaging
(See DRUMS—Wire Packaging)

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

CORDS—Electrical, Tinsel Conductor
Montgomery Co., The, Windsor Locks, Conn.

COUNTERS—
(See MACHINERY—Measuring Wire and Cable)

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, Ohio

CUTTING TOOLS—Carbide
Eastern Carbide Corp., New Rochelle, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.

CUTTING TOOLS—Wire
Porter, H. K., Inc., Somerville, Mass.
Robinson, M. W. Co., Rockville, Conn.

DIAMONDS—Industrial
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIAMOND POWDERS—
Danforth Company, C.W., Youngstown, Ohio
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Fort Wayne Diamond Products, Inc., Fort Wayne, Indiana
Hoosier Wire Die, Inc., Ft Wayne, Ind.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIAMOND POWDER RECLAIMING—
Danforth Company, C.W., Youngstown, Ohio
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Fort Wayne Diamond Products, Inc., Fort Wayne, Indiana
Hoosier Wire Die, Inc., Ft Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DIAMOND TOOLS—
Indiana Wire Die Co., Ft. Wayne, Ind.
Wayne Wire Die Co., Linden, N. J.

DIES—Carbide, Tungsten & Tantalum
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Rivom, Dijon, France
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIES—Cold Heading
Eastern Carbide Corp., New Rochelle, N. Y.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Rivom, Dijon, France

DIES—Diamond
Ajax Industrial Supplies, Inc., Ft. Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
Ft. Wayne Wire Die Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Wire Die Co., Inc., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Roux Wire Die Works, Inc., Oriskany, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIES DIAMOND—Reversible
Indiana Wire Die Company, Fort Wayne, Indiana
National Wire Die Co., Inc., New York, N. Y.

DIES—Extrusion
Central Tool and Machine Co., Bridgeport, Conn.
Eastern Carbide Corp., New Rochelle, N. Y.
Kelloy Corporation, New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Rivom, Dijon, France.
Rusch Wire Die Co., Croton-on-Hudson, N.Y.
Wayne Wire Die Co., Linden, N. J.

DIES—Eyelet
Eastern Carbide Corp., New Rochelle, N. Y.
Kelloy Corporation, New York, N. Y.

DIES—Nail, Nail Cutters, Feeder Blocks, Grippers, etc.
Pittsburgh Carbide Die Co., Monongahela, Pa.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
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Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
National Wire Die Co., Inc., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Roux Wire Die Works, Inc., Oriskany, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIES—Roll Threading
Rivom, Dijon, France

DIES—Special Shapes, Etc.
Eastern Carbide Corp., New Rochelle, N. Y.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Rivom, Dijon, France

DIES—Swaging
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

DIES—Tinning
American Lava Corporation, Chattanooga, Tenn.
Roux Wire Die Works, Inc., Oriskany, N. Y.

DIES—Tube Drawing
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Hoosier Wire Die., Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Rivom, Dijon, France
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DRAW BENCHES—
(See MACHINERY)—Draw Benches)

DRIVES—Variable Speed
Allis Co., Louis, Milwaukee, Wisc.

DRUMS—Wire Packaging
Hubbard Spool Company, Div., The American Pulley Co., Garrett, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

DRUMS & TRAVERSES—For Cable Reels
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Republic Steel Corp., Berger Div., Canton, Ohio

DRYING EQUIPMENT—
Carl Mayer Corp., The, Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FOAM PRODUCING COMPOUNDS—
Parkin Chemical Co., The, Pittsburgh, Pa.

FURNACES—Brazing
Ajax Electric Company, Philadelphia, Pa.
Sunbeam Equipment Corporation, Meadville, Pa.

FURNACES—Galvanizing Equipment
Ofenbau Fritz, G.m.b.H. & Co., K. G., Hagen (W. Germany)
Sunbeam Equipment Corporation, Meadville, Pa.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Heat Treating
Ajax Electric Company, Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Ofenbau Fritz, G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Sunbeam Equipment Corporation, Meadville, Pa.
Wilson Lee Engr. Co., Cleveland, Ohio

FURNACES—Pot (Oil, Gas, Electric)
Ajax Electric Company, Philadelphia, Pa.
Ofenbau Fritz, G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Sunbeam Equipment Corporation, Meadville, Pa.

FURNACES—Resistance Heating, Strand
Sunbeam Equipment Corporation, Meadville, Pa.

FURNACES—Salt Bath
Ajax Electric Company, Philadelphia, Pa.

FURNACES—Strand Annealing
Ajax Electric Company, Philadelphia, Pa.
Ofenbau Fritz, G.m.b.H. & Co. K. G., Hagen, (W. Germany)
Sunbeam Equipment Corporation, Meadville, Pa.

GALVANIZING EQUIPMENT—(See MACHINERY—Galvanizing Wire)

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

GUIDES—For Wire
American Lava Corporation, Chattanooga, Tenn.
Heany Industrial Ceramic Corp., New Haven, Conn.

GUIDE TIPS—For Extruding Machines (See NOZZLES)

HAMMERS—Nail Heading
Pittsburgh Carbide Die Co., Monongahela, Pa.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

INHIBITORS—Pickling
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INKS—Printing, for Insulated Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.

INSULATING MATERIALS—
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
General Electric Company, Insulating Materials Section, Schenectady, N. Y.
General Tire & Rubber Company, The, Akron, Ohio
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, Naugatuck, Conn.

LACQUERING SYSTEMS—See MACH.—Lacquering Electric Wire

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., The, Philadelphia and Bellefonte, Pa.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

MACHINE CONTROLS—Electronic
Allis Co., Louis, Milwaukee, Wisc.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Wm., Machine Works, Chicago, Ill.
Wafios Machinery Corp., Hackensack, N. J.

MACHINERY—Blast Cleaning
Wheelabrator Corporation, Mishawaka, Ind.

MACHINERY—Bobbin Winders
Associated American Winding Machinery, Inc., New York, N. Y.
Hanson & Edwards, Ltd., Warrington, England
Larmuth and Bulmer, Limited, Manchester, England

MACHINERY—Bolt, Rivet, Screw, etc.
Boltmaster Co., The, Cleveland, Ohio
National Machinery Co., Tiffin, Ohio
Prutton Corporation, Cleveland, Ohio.
Straus-Artys Corp., Great Neck, N. Y.
Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.

MACHINERY—Braiding
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Hanson & Edwards, Ltd., Warrington, England
Haskell-Dawes Machine Co., Philadelphia, Pa.
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bundling, Scrap
Vaughn Machinery Co., Cuyahoga Falls, Ohio

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Haskell-Dawes Machine Co., Philadelphia, Pa.
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Capstans and Machinery—Winding Wire)

MACHINERY—Centerless Grinding & Polishing
American Laubscher Corporation, New York, N. Y.

MACHINERY—Chain Link Fence
Norton & Co., Ltd., Sir James Farmer, Manchester, England
Steel & Wire Machinery Co., Cleveland, Ohio

MACHINERY—Chain Making
Larmuth and Bulmer, Limited, Manchester, England
Steel & Wire Machinery Co., Cleveland, Ohio
Wafios Machinery Corp., Hackensack, N. J.

MACHINERY—Closing Cable
Larmuth and Bulmer, Limited, Manchester, England
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N.J.

MACHINERY—Coiling Rod
Vaughn Mach'y Co., Cuyahoga Falls, Ohio
Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.

MACHINERY—Cold Heading
Boltmaster Co., The, Cleveland, Ohio
National Machinery Co., Tiffin, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.

MACHINERY—Copper Wire Drawing
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Herborn, Maschinenfabrik, Herborn, Germany
Johnson Machinery Co., Newark, N. J.
Morgardshammars Mek Verkstads A. B., Morgardshammar, Sweden
National Mach'y Exch (Used), New York
Showa Machine Works, Ltd., Osaka, Japan
Steel & Wire Machinery Co., Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.
Whitacre Engineering & Manufacturing Company, Alhambra, California

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Company, Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Mettler Machine Tool, Inc., New Haven, Conn.
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Dead Block (Stationary Coiler)
Morgan Construction Company, Worcester, Mass.
Wells Company, Frank L., Kenosha, Wisc.
Whitacre Engineering & Manufacturing Company, Alhambra, California
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Descaling Rod, Dry
Fisher Associates, New York, N. Y.
Herborn, Maschinenfabrik, Herborn, Germany
Pangborn Corporation, Hagerstown, Md.
Wheelabrator Corporation, Mishawaka, Ind.
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Diameter Control
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Die Making
Boulin, Victor J., Inc., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Sjogren Tool & Machine Co., Auburn, Mass.
Wayne Wire Die Co., Linden, N. J.

MACHINERY—Draw Benches
American Laubscher Corporation, New York, N. Y.
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Wire Machinery Inc., Chicago, Ill.

MACHINERY—Eccentricity Control (Insulated Wire)
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Edging (See MACHINERY—Tandem Rolling and Edging Mills)

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Michigan Oven Company, Detroit, Mich.

MACHINERY—Extruding
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
General Engineering Company (Radcliffe) Limited, Radcliffe, England
Johnson Machinery Co., Newark, N. J.
Royle, John, & Sons, Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc (used) Pawtucket, R. I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Norton & Co., Ltd., Sir James Farmer, Manchester, England
Wafios Machinery Corp., Hackensask, N. J.

MACHINERY—Flat Wire
Fenn Manufacturing Company, Newington, Conn.
Mettler Machine Tool, Inc., New Haven, Conn.
Steel Equipment Company, Cleveland, Ohio
Steel & Wire Machinery Co., Cleveland, Ohio
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Forming Wire
National Mach'y Exch. (Used), New York, N. Y.
Nilson Machine Co., A. H., Shelton, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel & Wire Machinery Co., Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Wafios Machinery Corp., Hackensack, N. J.

MACHINERY—Footage Meters
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Galvanizing Wire
Ofenbau Fritz G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Steel & Wire Machinery Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Whitacre Engineering & Manufacturing Company, Alhambra, California
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle Manufacturing Corporation, Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Impregnation Control, Paper Cables
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.

MACHINERY—Insulating Wire
American Insulating Mach'y Co., Phila., Pa.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Michigan Oven Company, Detroit, Mich.
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Pourtier Pere et Fils, Romainville (Seine), France
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Insulation Testing (See MACHINERY—Spark Testing)

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia, Pa.
Cook Mfg. Co., The, Paterson, N. J.
Michigan Oven Company, Detroit, Mich.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
EVG., Machinen & Stahl, A. G., Zurich, Switzerland

MACHINERY—Material Handling
(See Material Handling Equipment)

MACHINERY—Measuring Diam., Insulated Wire
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Measuring Wire & Cable
Davis Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wisc.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
General Engineering Company (Radcliffe) Limited, Radcliffe, England
Larmuth and Bulmer, Limited, Manchester, England
National Standard Electronics, Inc., New York, N. Y.
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Measuring and Control—Coating
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Measuring Width-Flat Wire
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works, Chicago, Ill.
National Machinery Co., Tiffin, Ohio
National Mach'y Exch. (Used), N.Y., N.Y.
Wafios Machinery Corp., Hackensack, N. J.

MACHINERY—Packaging Wire
Advanced Wyrepak Co., Inc., Bridgeport, Conn.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Whitacre Engineering & Manufacturing Company, Alhambra, California

MACHINERY—Patenting Wire
Ofenbau Fritz G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Whitacre Engineering & Manufacturing Company, Alhambra, California

MACHINERY—Pin Making
Nilson Machine Co., A. H., Shelton, Conn.
Wafios Machinery Corp., Hackensack, N. J.

MACHINERY—Plating
Bartell Machine Tool Corp., Rome, N. Y.
Hodge Bros. Machine Shop, Ossining, N. Y.
Universal Industrial Equipment Co., Secaucus, N. J.

MACHINERY—Pointing
Herborn, Maschinenfabrik, Herborn, Germany
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Straus-Artys Corp., Great Neck, N. Y.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.

MACHINERY—Printing on Electric Wire
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.
Gillies, Duncan M. Co., Inc., West Boylston, Mass.

MACHINERY—Re-Spooling
Associated American Winding Machinery, Inc., New York, N. Y.
Bartell Machine Tool Corp., Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Herborn, Maschinenfabrik, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
National Mach'y Exch. (Used), New York, N. Y.
Vaughn Machinery Co., Cuyahoga Fall, Ohio
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

MACHINERY—Rod Mill
Baldwin-Lima-Hamilton, Industrial Division, New York, N. Y.
Herborn, Maschinenfabrik, Herborn, Germany
Morgan Construction Co., Worcester, Mass.

MACHINERY—Rolling Mill
Fenn Manufacturing Company, Newington, Conn.
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.

MACHINERY—Rubber Insulating
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Royle, John & Sons, Paterson, N. J.
Western Wire & Textile Machinery, Inc., So San Francisco, Calif.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

MACHINERY—Serving
Pourtier Pere et Fils, Romainville (Seine), France
Wardwell Braiding Machine Co., Central Falls, R. I.

MACHINERY—Slitting Mills
Steel Equipment Company, Cleveland, Ohio

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wafios Machinery Corp., Hackensack, N. J.
Wells Company, Frank L., Kenosha, Wisc.

MACHINERY—Staple Making
Wafios Machinery Corp., Hackensack, N. J.

MACHINERY—Straightening & Cutting
American Laubscher Corporation, New York, N. Y.
Johnson Machinery Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Patterson, George C. Machine Co., Cleveland Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Steel & Wire Machinery Co., Cleveland, Ohio
Wells Company, Frank L., Kenosha, Wisc.

MACHINERY—Stranding
Bartell Machine Tool Corp., Rome, N. Y.
Hanson & Edwards, Ltd., Warrington, England
Haskell-Dawes Machine Co., Philadelphia, Pa.
Johnson Machinery Co., Newark, N. J.
Krupp, Fried., Machinen-Und Stahlbau Rheinhausen, Germany
Larmuth & Bulmer Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Swaging
Fenn Manufacturing Company, Newington, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.

MACHINERY—Tandem Rolling & Edging Mills
Fenn Manufacturing Company, Newington, Conn.

MACHINERY—Take-Up and Pay-Out
Advanced Wyrepak Co., Inc., Bridgeport, Conn.
American Insulating Mach'y Co., Phila., Pa.
Associated American Winding Machinery, Inc., New York, N. Y.
Bartell Machine Tool Corp., Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
General Engineering Company (Radcliffe) Limited, Radcliffe, England
Johnson Machinery Co., Newark, N. J.
Larmuth & Bulmer Limited, Manchester, England
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Pourtier Pere et Fils, Romainville (Seine) France
Standard Mill Supply Co., Pawtucket, R. I.
Steel Equipment Company, Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.
Whitacre Engineering & Manufacturing Company, Alhambra, California

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Pourtier Pere et Fils, Romainville (Seine) France
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Thread Rolling
Boltmaster Co., Cleveland, Ohio
Mettler Machine Tool, Inc., New Haven, Conn.
Prutton Corporation, Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.

Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Ofenbau Fritz G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Syncro Machine Co., Perth Amboy, N. J.
Universal Industrial Equipment Co., Secaucus, N. J.
Whitacre Engineering & Manufacturing Company, Alhambra, California

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyanoga Falls, Ohio

MACHINERY—Tube Mill, Cold Drawing
Johnson Machinery Co., Newark, N. J.
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
Johnson Machinery Co., Newark, N. J.
National Machinery Exchange, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Welded Wire Mesh
EVG, Maschinen and Stahl, A.G., Zurich, Switzerland
Schlatter, Ltd., H. A., Zollikon/Zurich

MACHINERY—Variable Speed Drives
Allis Co., Louis, Milwaukee, Wisc.

MACHINERY—for Wire Welding
(See WELDERS—Butt and Spot and Machinery—Welding Wire Fabrics)

MACHINERY—Winding Wire
Associated American Winding Machinery, Inc., New York, N. Y.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Enjaco Corporation, Cranston, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Standard Mill Supply Co., Pawtucket, R. I.
Steel Equipment Company, Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Laubscher Corporation, New York, N. Y.
Cook Manufacturing Co., The, Paterson, N. J.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Fenn Manufacturing Company, Newington, Conn.
Herborn, Maschinenfabrik, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
Johnson Machinery Co., Newark, N. J.
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Morgan Construction Co., Worcester, Mass.
Morgardshammars Mek Verkstads AB, Morgardshammar, Sweden
National Mach'y Exch. (Used), New York, N. Y.
Norton & Co., Ltd., Sir James Farmer, Manchester, England
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Showa Machine Works Ltd., Osaka, Japan
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Wire and Machinery Co., Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Superior Tool & Machinery Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Waterbury-Farrel Fdry. & Mach. Co., Division of Textron Inc., Waterbury, Conn.
Whitacre Engineering & Manufacturing Company, Alhambra, California
Wire Machinery Inc., Chicago, Ill.

MACHINERY—Wire Preheating
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.

MACHINERY—Wire Rope
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
American Laubscher Corp., New York, N. Y.
Larmuth (1947) Ltd., Swinton, England
Terkelsen Machine Company, Boston, Mass.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, Ohio

MOTORS—Electric
Allis Co., Louis, Milwaukee, Wisc.

NAIL TOOLING—Tungsten Carbide
Pittsburgh Carbide Die Co., Monongahela, Pa.

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Pan American Trade Development Corp. New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.

NIPPERS—Wire Cutting
Robinson, M. W. Co., Rockfall, Conn.

NOZZLES—For Extruding Machines
Central Tool and Machine Co., Bridgeport, Conn.

OVENS—Cable Lacquering and Enameling
American Insulating Mach'y Co., Phila., Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Colbourne Machine Company, Winsted, Conn.
Michigan Oven Company, Detroit, Mich.

OVENS—Rod Bakers
Carl Mayer Corp., The, Cleveland, Ohio

OVENS—Welding Rod Coating
Carl Mayer Corp., The, Cleveland, Ohio

PAILS—Packaging
(See Drums—Wire Packaging)

PAPER—Coil Wrapping
Ludlow Papers, Needham Heights, Mass.

PAPER—Insulating
Ludlow Papers, Needham Heights, Mass.
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
Twitchell, Inc., E. W., Philadelphia, Pa.

PAY-OUT SYSTEMS—
(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS
(See COMPOUNDS—Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PLASTICIZERS—
Cary Chemicals, Inc., New Brunswick, N. J.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.

PLASTICS—for Wire Insulation
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
Escambia Chemical Corporation, New York, N. Y.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Union Carbide Plastics Company, Div. of Union Carbide Corporation, New York, N. Y.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, Naugatuck, Conn.

PRINTING WHEELS—for Electric Wire
Daniels & Co., Frank, New York, N. Y.
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Co., Inc., West Hanover, Mass.
Gillies, Duncan M. Co., Inc., West Boylston, Mass.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, Ohio

PULLEYS—Ceramic
American Lava Corporation, Chattanooga, Tenn.

RACKS—Wire Storage
Jarke Manufacturing Co., Chicago, Illinois

REEL AND TENSION STANDS—
Mettler Machine Tool, Inc., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Republic Steel Corp., Berger Div., Canton, Ohio

REELS—Metal Bound
Durkee Mfg. Co., Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.

REELS—Plywood
Carris Reels, Inc., Rutland, Vt.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Clark Manufacturing Co., J. L., Rockford, Illinois.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
New York Engineering Corp., Yonkers, N. Y.
Republic Steel Corp., Berger Div., Canton, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS—Steel, for Rope and Cable
New York Engineering Corp., Yonkers, N. Y.

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Molded Fiber Glass Tray Co., Linesville, Pa.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Nelson Co., The, Baltimore, Md.
Republic Steel Corp., Berger Div., Canton, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Wood
American Wood Working Co., Montello, Wisc.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Nelson Co., The, Baltimore, Md.

REFRACTIONS—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—
(See OVENS—Rod Bakers)

RODS—Stainless Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio

RODS—Wire—Non-Ferrous
Platt Bros. & Co., The, Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.

RODS—Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Corporation, Detroit, Mich.
Keystone Steel & Wire Co., Peoria, Ill.
Niederrheinische Huette, A. G., Duisburg, Germany
Pan American Trade Development Corp. New York, N. Y.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

ROPE—Wire
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Roebling's, John A. Sons, Div. Colorado Fuel & Iron Corp., Trenton, N. J.

RUST PROOF COMPOUNDS—
(See COMPOUNDS—RUST Removing)

RUST REMOVING COMPOUNDS—
(See COMPOUNDS—RUST Preventing)

SATURATION SYSTEMS—
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
(See COMPOUNDS—Wire Drawing)

SPOOLS—For Retail Sale of Wire
Clark Manufacturing Co., J. L., Rockford, Illinois.

SPOOLS—Plastic
Associated American Winding Machinery, Inc, New York, N. Y.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Molded Fiber Glass Tray Co., Linesville, Pa.
Plastic Mold & Engineering Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.

STAMPINGS—Steel
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.

STOCK STORAGE SYSTEMS
Jarke Manufacturing Co., Chicago, Illinois

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Roebling's, John A. Sons Div. Colorado Fuel & Iron Corp., Trenton, N. J.

TANKS—Ceramic, for Galvanizing
Ofenbau Fritz G.m.b.H. & Co. K. G., Hagen, W.-Germany)

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TENSION METERS—for Wire
Boulin Instrument Corporation, Pelham, N. Y.
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
Tensitron, Inc., Harvard, Mass.

TESTERS—INSULATION
(See Testing Equipment—for Dielectric Faults)

TESTING EQUIPMENT — Dielectric Faults in Insulation
Davis Electric Co., Wallingford, Conn.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
Peschel Electronics, Inc., Patterson, N. Y.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

TESTING EQUIPMENT — Physical
Scott Testers, Inc., Providence, R. I.

TINSEL—Electric Conductor
Montgomery Co., The, Windsor Locks, Conn.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper Silver and False Gold Coated, etc.
(See TINSEL—Electric Conductor)

TOOLS—Nail Machine
Pittsburgh Carbide Die Co., Monongahela, Pa.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

TRANSMISSIONS—Variable speed (See Adjustible Speed Drives)

TRAVERSES & DRUMS—For Reels
(See Drums & Traverses)

TRAVERSE MECHANISMS—
Associated American Winding Machinery, Inc., New York, N. Y.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Hodge Bros. Machine Shop, Ossining, N. Y.
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

VARNISHES & LACQUERS—for Electric Wire
General Electric Company, Insulating Materials Section, Schenectady, N. Y.

VULCANIZING PANS AND EQUIPMENT—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.

WAXES—for Insulated Wire
Cary Chemicals, Inc., New Brunswick, N. J.

WELDERS—Spot and Butt and Welding Wire Fabrics
Eisler Engineering Corp., Newark, N. J.
EVG, Maschinen and Stahl, A.G., Zurich, Switzerland
Micro Products Co., Chicago, Ill.
Schlatter, Ltd., H. A., Zollikon-Zurich

WHEELS—for Printing on Electric Wire
Daniels & Co., Frank, New York, N. Y.
Gem Gravure Company, West Hanover, Mass.
Gillies, Duncan M., Co., Inc., West Boylston, Mass.

WIRE—Aluminum
Malin & Co., The, Cleveland, Ohio
Scovill Mfg Co., Waterbury, Conn.

WIRE—Ball
Marathon Specialty Steels, Inc., New York, N. Y.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Barbed
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

WIRE—Brass and Bronze
Malin & Co., The, Cleveland, Ohio
Scovill Mfg. Co., Waterbury, Conn.

WIRE—Bunched and Stranded
Camden Wire Company, Camden, N. Y.

WIRE—Cadmium
Stamford Processing Co., Peekskill, N. Y.

WIRE—Cold Heading
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Keystone Steel & Wire Co., Peoria, Ill.
Scovill Mfg. Co., Waterbury, Conn.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Copper
Camden Wire Company, Camden, N. Y.
Malin & Co., The, Cleveland, Ohio

WIRE—For Electrical Conductors
Camden Wire Company, Camden, N. Y.

WIRE—Flat
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Jones & Laughlin Steel Corp, Stainless and Strip Div., Detroit, Mich.
Montgomery Co., The, Windsor Locks, Conn.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Galvanized
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Pan American Trade Development Corp., New York, N. Y.
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
Wickwire Spencer Steel Div., Colorado, Fuel & Iron Corp., New York, N. Y.

WIRE—High Carbon
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Detroit Steel Corporation, Detroit, Mich.
Marathon Specialty Steels, Inc., New York, N. Y.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Manufacturers
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Keystone Steel & Wire Co., Peoria, Ill.
Marathon Specialty Steels, Inc., New York, N. Y.
Republic Steel Corp., Berger Div., Canton, Ohio
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
Scovill Mfg. Co., Waterbury, Conn.
U. S. Steel Corp., N. Y., N. Y.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Metalizing
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Platt Bros & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WIRE—Music
Malin & Co., The, Cleveland, Ohio
Suzuki Metal Industry Co., Ltd., Tokyo, Japan

WIRE—Needle
Marathon Specialty Steels, Inc., New York, N. Y.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Alloy
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Malin & Co., The, Cleveland, Ohio

WIRE—Oil Tempered
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Malin & Co., The, Cleveland, Ohio
Pan American Trade Development Corp., New York, N. Y.
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
Suzuki Metal Industry Co., Ltd., Tokyo, Japan
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE Prestressed Concrete Reinforcement
Suzuki Metal Industry Co., Ltd., Tokyo, Japan

WIRE—Special Shapes
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Spring
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Keystone Steel & Wire Co., Peoria, Ill.
Marathon Specialty Steels, Inc., New York, N. Y.
Pan American Trade Development Corp., New York, N. Y.
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
Suzuki Metal Industry Co., Ltd., Tokyo, Japan
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Stainless Steel
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Malin & Co., The, Cleveland, Ohio
Nippon Stainless Steel Wire Mfg. Co., Ltd., Osaka, Japan
Pan American Trade Development Corp., New York, N. Y.
Suzuki Metal Industry Co., Ltd., Tokyo, Japan
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.

WIRE—Steel—Also Coppered and Galvanized Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Malin & Co., The, Cleveland, Ohio
Pan American Trade Development Corp., New York, N. Y.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp. Trenton, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Straightening and Cutting
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Tire Bead
Suzuki Metal Industry Co., Ltd., Tokyo, Japan

WIRE—Upholstery and Mattress
Pan American Trade Development Corp., New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WOOD—for Guide, Rolls, Bushings, Wear Parts, etc.

WRAPPING PAPER—Creped
(See PAPER—Creped Wrapping)

YARN TESTERS—
National Standard Electronics, Inc., New York, N.Y.
Scott Testers, Inc., Providence, R. I.

YARNS—Wire Insulating
Chadwick Yarn Company, Pawtucket, R. I.
Synthetic Thread Co., Bethlehem, Pa.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 16, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE
AND MASTICATING MACHINERY MANUFACTURERS

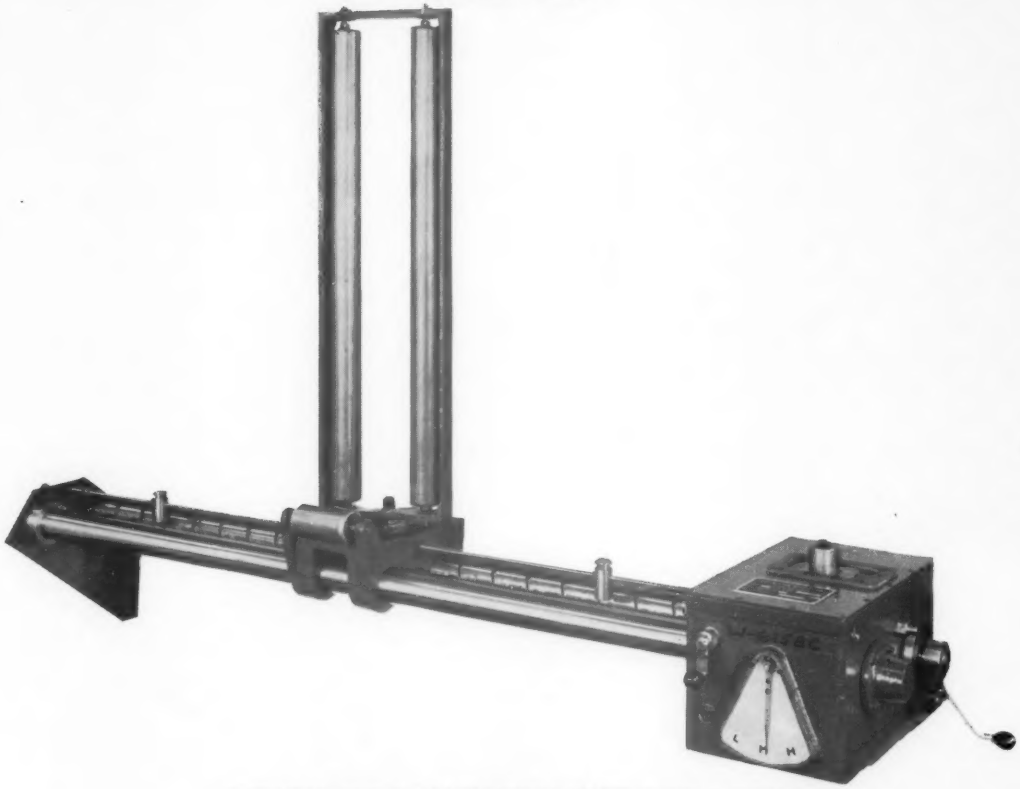
WATSON

INTRODUCING

OUR ALL NEW, AUTOMATIC, INFINITELY VARIABLE

HEAVY DUTY TRAVERSE "VR"

U. S. PATENT 2,898,770



STEPLESS SPEED VARIATION OVER 7 TO 1 RANGE.

INSTANT REVERSAL BETWEEN ADJUSTABLE LIMIT STOPS.

HIGH OUTPUT TORQUE RATING.

ALL ADJUSTMENTS MAY BE MADE WHILE OPERATING.

MANUAL POSITIONING OF GUIDE BY CRANK ARM.

REMOTE ELECTRICALLY CONTROLLED GUIDE ADJUSTMENT AVAILABLE.

GEARBOX ASSEMBLED RIGHT OR LEFT HAND
WITHOUT DISTURBING INTERNAL MECHANISM.

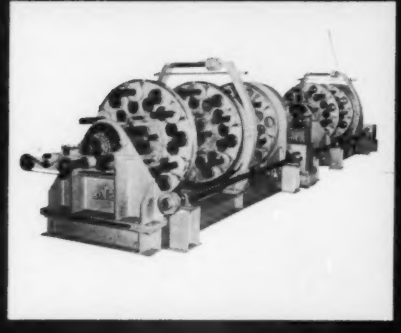
ROLLER GUIDE "R" SHOWN, SHEAVE GUIDE "S" AVAILABLE

GEARBOX ADAPTABLE AS A VARIABLE SPEED REVERSING DRIVE.

4-60

"better machinery for the wire industry"...

a result of creative engineering with production know-how. Syncro Machine Company manufactures a complete line of wire drawing and cable mill equipment, with emphasis on low-cost, dependable, operation. A symbol of high quality and efficiency —Syncro continues to meet the demands for a competitive wire and cable industry.



Our Engineers welcome the opportunity to give you further information on how Syncro can help meet your plant's wire and cable production requirements. Write Syncro Machine Company, Dept. C, Perth Amboy, New Jersey, or Phone Hillcrest 2-5500.

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SYNCRO

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